WHITE PINE BLISTER RUST CONTROL IN NORTHEASTERN REGION

ANNUAL REPORT FOR 1951

United States Department of Agriculture
Agricultural Research Administration
Bureau of Entomology and Plant Quarantine
20 Sanderson Street
Greenfield, Massachusetts

FOREWORD

This report relates to activities during the calendar year 1951 in the control of the white pine blister rust disease in the Northeastern Region comprising the states listed below:

Northeastern States		Southern Appalachian States	
Connecticut	New Jersey	Delaware	North Carolina
Maine	New York	Georgia	South Carolina
Massachusetts	Pennsylvania	Kentucky	Tennessee
New Hampshire	Rhode Island	Maryland	Virginia
Vermont		West Virginia	

As of August 1951, work in the Southern Appalachian States was transferred to the jurisdiction of the new Northeastern Region. The program is operated by the Bureau of Entomology and Plant Quarantine, Agricultural Research Administration of the United States Department of Agriculture, in cooperation with the department or agency in each state having statutory responsibility for the control of the disease, and with other federal land-owning agencies. As of January 1, 1951, the problem involved the effective and efficient destruction of ribes on a net control area of 18,340,572 acres, for the protection of the white pine on 7,317,859 acres.

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PART I

GENERAL STATEMENT

Importance of White Pine

The white pine in the aggregate control area in the region represents 61% of the total pine acreage in the United States designated for blister rust protection work. The volume of mature pine amounts to over 10 billion board feet with a stumpage value of $145 million. In addition, the immature pine has an estimated potential volume of 46 billion board feet, worth $655 million. In the Northeastern States section of the region white pine is generally distributed in Maine and New Hampshire but confined to rather well defined portions of the other states. In the Southern Appalachian section, white pine occurs chiefly in mixture with other species or as an understory in scattered areas along a strip from 3 to 8 counties wide in the western part of Maryland, Virginia and Tennessee, northern border counties of Georgia, and in 15 counties in east central Kentucky.

The most important contribution of the white pine forests is represented by the production of lumber. During the period 1904 to 1947, inclusive, over 29½ billion board feet of white pine lumber was produced in the region. During the ten-year period from 1938-1947, inclusive, 46% of the total production of 16 billion board feet of white pine lumber in the United States, was produced in this region. In spite of the heavy drain that has taken place, current reports show a continuing production. For example, the Maine Forest Service reported in 1950 a production of over 279 million bd. ft. representing 65% of the total softwood produced in Maine. The price situation continues to be an incentive, with instances in Maine and Vermont where logs at the mill brought $35 and $40 per M bd. ft.

The substantial production of lumber is indicative of the suitability of the lands in the region for the growing of white pine. The Extension Forester of Vermont reports growth studies showing that white pine at age 60 produces 5.7 times more bd. ft. of lumber than hardwoods, 3.2 times more than hemlock, and 3.5 times more than spruce. Observations in the Southern Appalachians show exceptionally rapid growth rates in many places. With the killing of the chestnut, white pine is becoming of increasing importance in the development of the forests in these states. The amount of pine is steadily increasing through natural regeneration and increased interest in planting. The blister rust control program has helped materially in both phases of this increase in the forest resource.

Active interest in management and utilization is more and more in evidence. Reports during the year include such items as the formation of an association of timberland owners and operators of Rockingham County, New Hampshire, for the purpose of promoting better forest management; fire, disease and insect control; and cooperative marketing of small timber lots. The Forest Utilization Service of the Northeastern Forest Experiment Station has demonstrated the successful utilization of low quality pine by cutting trees into 8-foot logs for manufacture into knotty-pine panel stock. In one Vermont district, several operations were noted where the products from thinnings were sold to a bucket factory at a price that netted a good profit to the owner and the private forester responsible for the operation.

The increased use of white pine for pulp has opened a new market for thinnings from pole stands, and incidentally but importantly, a market for the salvage of blister rust infected trees. Paper and pulp mills are installing new pulpwood barking machines. Experiments are in progress on the use of chemicals for debarking. If successful, the method will be beneficial in inducing owners to manage their pole stands of white pine, since owners themselves will be able to do the peeling. There is a danger, of course, that the use of white pine for pulp can result in the diversion of quality timber for the purpose and defeat the objectives of management for improved quality and returns. There is increasing evidence that the representatives of such agencies as the New England Forestry Foundation, Connwood Inc., American Forest Products Industries, Inc., and others, together with Extension Foresters, State District Foresters, Soil Conservation and Farm Foresters are convincing land owners of the benefits to be derived from better management of their forest properties, including protection against fire, insects and such diseases as white pine blister rust.

There is continued interest in the growing of white pine for reforestation purposes. This is particularly in evidence in the Southern Appalachian section where stock is being produced in forest nurseries in 6 states and the TVA in Tennessee. These nurseries contained over 12 million white pines in 1950. Over 4½ million white pines were planted in the Southern Appalachian States last year, 53% being in North Carolina.

The outstanding importance of white pine for its aesthetic value to the increasing recreational business in the region is demonstrated in the many stands of pine which constitute the principal attractant in the youth camps, summer and winter resorts, and recreational centers in countless numbers. In the Southern Appalachians, the white pine forests form scenic backgrounds along motor roads and in recreational areas in the Blue Ridge Parkway of North Carolina and Virginia, the Shenandoah National Park in Virginia, and the Great Smoky Mountain National Park in North Carolina and Tennessee.

The white pines in several of the Northeastern States suffered severe damage as a result of "The Great Storm of November 25, 1950". During the early months of 1951 repeated reports were received by the regional office describing the tremendous loss caused by the storm, referred to locally as the worst in 300 years with winds exceeding 100 miles an hour. The greatest damage occurred in New York where the State Conservation Department estimated 1,694,981 cords of soft woods (spruce, fir and pine) worth $50 million was blown down on state and private lands. In addition 12½ million bd. ft. of saw timber mostly hardwoods was felled. At present capacity, it would keep New York pulp mills supplied for three years. It would take a force of 10,000 men roughly 4 months to trim the felled trees, buck the logs and pile them in accessible places. The damage to public camp sites was estimated at $100,000. The New York legislature appropriated $200,000 to salvage storm-felled trees in the Adirondack Forest Preserve where no cutting has been permitted on state-owned lands for 50 years. Extensive damage occurred also in Vermont. On the property of the Vermont Tuberculosis Sanitarium in Pittsfield, Vermont, approximately a half million board feet of white pine was blown down. In Addison County, Vermont, at least 30 million board feet of timber and 6,500 cords of pulpwood were involved. It was estimated that 35-50% was white pine. On the property of the Johnson Lumber Company in Bristol, Vermont, 2 million board feet were damaged, a volume sufficient to keep their mill running for nearly two years. There was considerable loss in southwestern

Connecticut. In New Hampshire some tree damage occurred such as at Lisbon where the holdings of the Lisbon Lumber Co. were so badly damaged that logging will be necessary to salvage 600,000 board feet. In most instances in the area affected by the storm, the pines were broken or splintered, making the possibility of salvage questionable.

Occurrence of Pine Infection and Damage

The disease was accidentally introduced into the Northeastern States at the turn of the century on shipments of imported white pine planting stock. By 1915 it had spread to native white pine and soon became general. In contrast to conditions in the Northeastern States, planting of imported infected stock was rather limited in the Southern Appalachian States. At the present time, infection on the pine host is generally distributed in counties in western Maryland, eastern West Virginia, western Virginia, and in a few counties in western North Carolina. It has been found in one county in northeastern Tennessee.

There is abundant evidence of the destructiveness of the disease in the Northeastern States. Studies in Maine, New Hampshire, Vermont and New York, for example, showed 45 percent of the pines dead or certain to die, representing at least 50 percent of the crop volume. In a study of mature pine at Waterford, Vermont, 73% of the crop pines were dead or sure to die as a result of the rust. The dead trees alone plus loss in increment represented 49 percent of the total volume. An additional 25 percent of the volume was in living pines with stem cankers. These pines would die and add to the crop loss. (See Chart I). During 1951 the presence of damage was emphasized by the increasing interest on the part of owners in the salvage of infected pines.

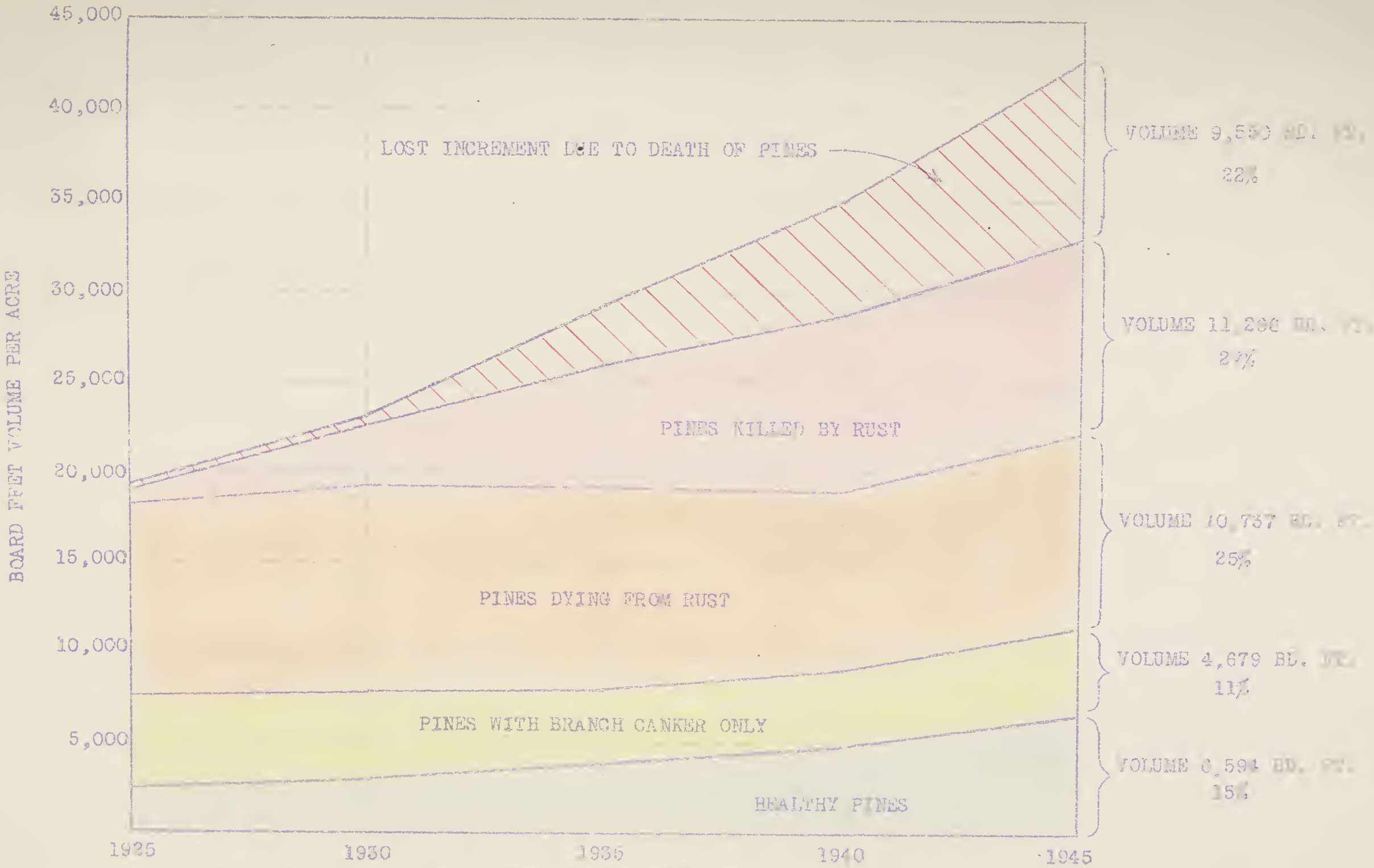
In the Southern Appalachians damage in control areas to date is negligible but in uncontrolled areas serious infection occurs in some instances.

Accomplishments in the Control Program to Date

At the end of 1951 the control of the disease had been established temporarily on 70.9% of the control acreage in the region. This accomplishment is represented in the figure of 12,944,302 acres currently in the maintenance classification. The attainment of this control condition has involved the destruction of 348,977,019 ribes in first, second or other workings since 1918 on a gross area of 31,810,487 acres. Table 1 shows the status of control by land ownership classes.

CHART I

BLISTER RUST DAMAGE IN MATURE PINE AREA, WATERFORD, VT.



STUDY AREA: 2.43 ACRES, TOTAL VOLUME OF STAND 1945 - 81,011 BD. FT.
EXCLUSIVE OF LOST INCREMENT OF DEAD PINES

Table 1 - Status of Ribes Eradication Work 1951 - Region Totals

Land Ownership Class	Acreage of Control Area	Acreage Worked			Acreage on Maintenance	Percentage of Control Area			
						Worked			On Maintenance
		Once	Twice	Other		Once	Twice	Other	
State & Private	16,339,917	15,862,623	6,924,886	2,657,248	11,118,479	97.1	42.4	16.3	68.0
National Forest	1,771,049	1,765,825	100,431	49,474	1,679,255	99.7	5.7	2.8	94.8
National Park	155,936	155,936	18,783	12,797	146,123	100.0	12.0	8.2	93.7
Indian Lands	445	445	-	-	445	100.0	-	-	100.0
Totals	18,267,347	17,784,829	7,044,100	2,719,519	12,944,302	97.4	38.6	14.9	70.9

An essential phase of the control program involves surveys and the examination of control areas to determine current conditions and the preparation of field maps showing the location of pine requiring control work, protection zone lines, ribes sites, etc., as a guide to ribes eradication units. Detailed mapping in the Northeastern States had been completed on December 1951 on 8,891,921 acres, representing 80.8% of the net control area.

In the Southern Appalachian States, mapping has been designated as Survey Work. The survey is complete in 15 counties in North Carolina and only a small amount will be necessary in the remaining 10. There is considerable unsurveyed white pine in 6 counties. The survey is complete in Delaware, Maryland, Kentucky, Tennessee, Georgia and South Carolina. Where survey work has been completed, there will of course, be future need for re-survey to keep up with normal changes in white pine distribution brought about by planting, natural reproduction, cutting, fire, etc.

In the Northeastern States, special work contributing to the control status has included the protection of white pine reforestation stock in 35 federal, state and commercial nurseries. A campaign to completely eliminate the especially susceptible European black currant required the inspection of nearly 1-¾ million properties and the removal therefrom of 103,000 plants in 46,397 patches. A special blister rust canker elimination project on public lands resultedin the destruction of 287,234 fatally infected pines and the treatment of an additional 395,514 pines by the removal of 946,746 cankers.

Through informational and service activities the public has been kept fully informed and has responded commendably in support of and in participation in the control program. In contact with forest owners, the project personnel has emphasized the importance of forest management and in particular has stressed selective cutting as an aid in preventing the regeneration of ribes. The personnel in the Northeastern States from 1922 to 1951 addressed 11,137 meetings, attended by 622,456 individuals. The press has been furnished 12,709 informative items, and 6,760 displays have been placed in store windows, at agricultural fairs or other places of public assembly. Motion picture films have been used effectively. Special courses of instruction have been arranged particularly in recent years at the several forestry schools. Information has also been disseminated to the general public by means of radio and television.

All of the above activities are designed to insure the future capacity of the white pine forests to add to the wealth of the region through products and service.

Methods Development

Constant attention has been given to reducing costs and increasing the effectiveness of control work. Among the notable accomplishments in this respect have been the general reduction in size of eradication crew units, the reduction of protection zone widths, the use of the drag-line system, the application of salt and borax for the eradication of bushes in different situations and the more recent use of ra.icides such as 2,4,5-T. Stress has been placed on the training of field personnel including the development of manuals of instruction. Within recent years special efforts have been devoted to increasing the efficiency of detailed mapping procedures, the devotion of time to the examination of control areas to determine present control needs, and most especially, the training of scouts to cope with the present situation where intensive crew work is no longer needed on extensive acreages. Another important illustration of the effort to increase the efficiency of the program relates to the assignment of personnel. In October 1950, the state leader positions were abolished and replaced by area leaders, each charged with the responsibility for the control program in two or more states. Concurrently with this change, districts were reorganized to more efficiently handle the present work load. Coincident with this reorganization, the regional office was moved to Greenfield, Massachusetts, as part of a plan to centralize Bureau activities in five regions in the United States.

The Continuing Problem

Although excellent progress in the control of the disease has been made, much remains to be done to insure adequate protection of the pine resources of the region. The continuing problem is challenging. Future requirements include the performance of first work on 452,518 acres and re-examination

to determine the need for rework on 4,840,527 acres not as yet in the maintenance classification. In addition, periodic examinations at 5 to 10-year intervals chiefly to locate disturbed areas will be necessary on nearly 13 million acres now on maintenance. Work will be needed in those portions where ribes have become a new menace to the pines. It is anticipated this will involve yearly examination and necessary remapping of 1/10th of the control area and intensive eradication on only 15% of the area examined. About two million acres in the Northeastern States have never been initially detailed mapped. However, a considerable percentage of the unmapped area is already on maintenance and mapping will be needed only on such portions as are designated eventually for rework.

To determine the future cost of control work in the region, calculations were made in November 1951 based on recorded data as of November 30, 1950 plus estimates of the 1951 accomplishments. The yearly costs derived from these calculations are shown in Chart II.

To complete required initial control on 416,000 acres, rework 4,973,000 acres, complete initial mapping on 1,803,000 acres and perform necessary maintenance work during the next 5 years (1952-1956) will cost $763,210 per year, or $126,000 more than the total amount of Bureau, State and local money available for the current year. Most of this additional money is needed to do the large volume of pre-maintenance work in Maine, New Hampshire and Vermont. The control work required during 1957 to 1961 will cost $522,675 annually or $240,535 less than during the 1952 to 1956 period. After that time, with all work devoted to maintaining control, the yearly cost will amount to only $352,000. All cost figures are based on 1951 values. The production rates used in the calculations are as follows:

Item	Acres per Man Day Rate
Initial working	25
Second working	40
Other workings	50
Maintenance working	25
Mapping	300
Examination and remapping	500
Cost per effective man day	$ 12.10

To accomplish the task will require competence of a high order maintained through continued federal, state and local support and participation.

Charts III and IV show the status of control on December 31, 1951 in the Northeastern States and the Southern Appalachian States respectively. Chart V shows the workload in similar fashion.

CHART II

BLISTER RUST CONTROL WORK NEEDED NORTHEASTERN REGION

1952-1961

YEARLY WORK REQUIRED
1952-1956, INCLUSIVE

INITIAL WORK 93,000 ACRES

REWORK
994,600 ACRES
(60% To Maintenance)

INITIAL MAPPING
300,600 ACRES

MAINTENANCE WORK

EXAMINATION AND
NECESSARY REMAPPING

1,834,000 ACRES

REWORK
275,000 ACRES

ANNUAL COST 1952-1956
$703,210

YEARLY WORK REQUIRED
1957-1961, INCLUSIVE

REWORK
460,200 ACRES

MAINTENANCE WORK

EXAMINATION AND
NECESSARY REMAPPING

1,834,000 ACRES

REWORK
275,000 ACRES

ANNUAL COST 1957-1961
$582,675

YEARLY WORK REQUIRED
AFTER 1961

MAINTENANCE WORK

EXAMINATION AND
NECESSARY REMAPPING

1,834,000 ACRES

REWORK
275,000 ACRES

ANNUAL COST
$352,000

CHART 111

NET ACCOMPLISHMENTS IN BLISTER RUST CONTROL IN NORTHEASTERN STATES - NOVEMBER 30, 1951

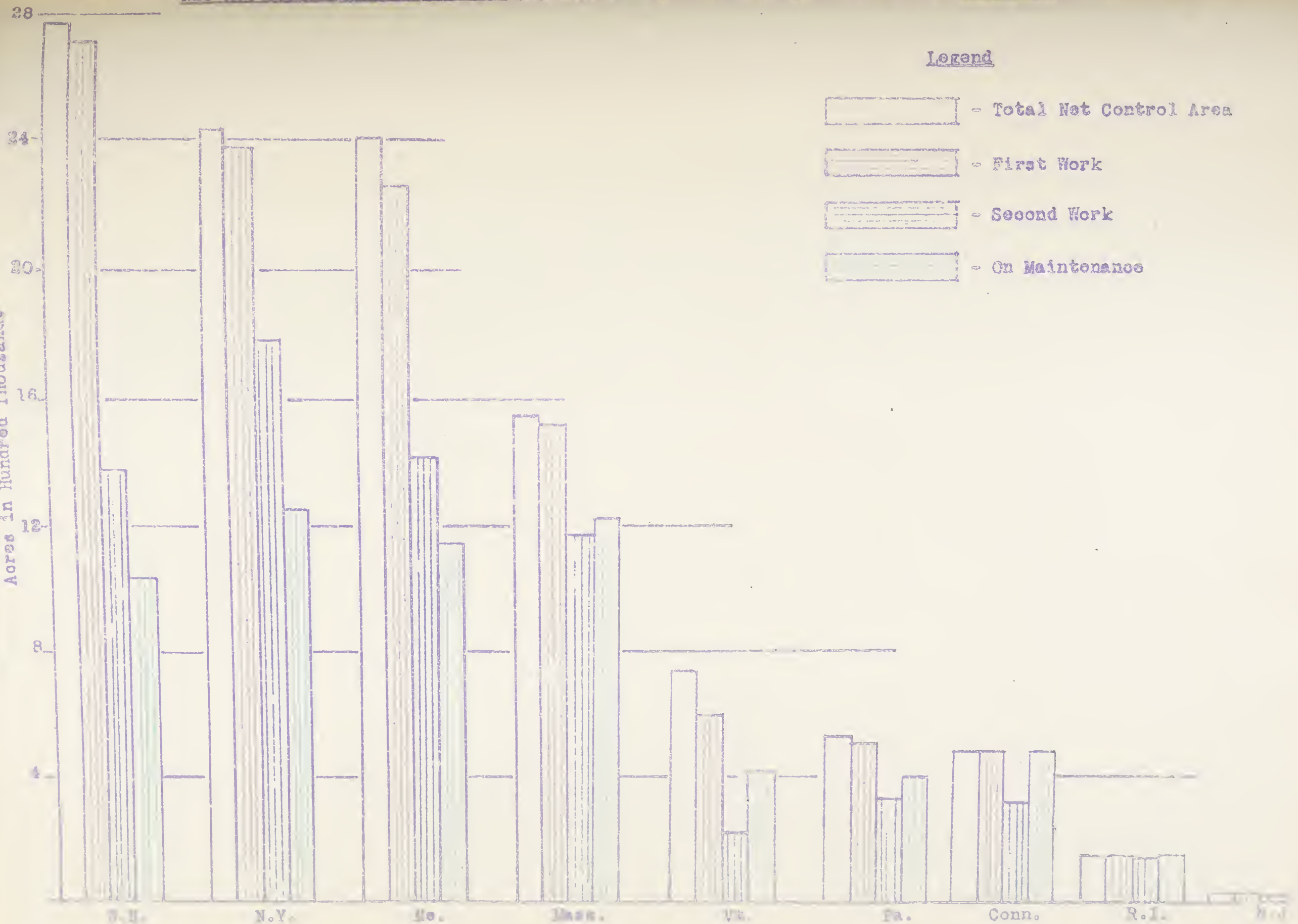


CHART IV

NET ACCOMPLISHMENTS IN BLISTER RUST CONTROL IN SOUTHERN APPALACHIAN STATES - NOVEMBER 30, 1951

Legend

- Total Control Area
- First Work
- Second Work
- Maintenance

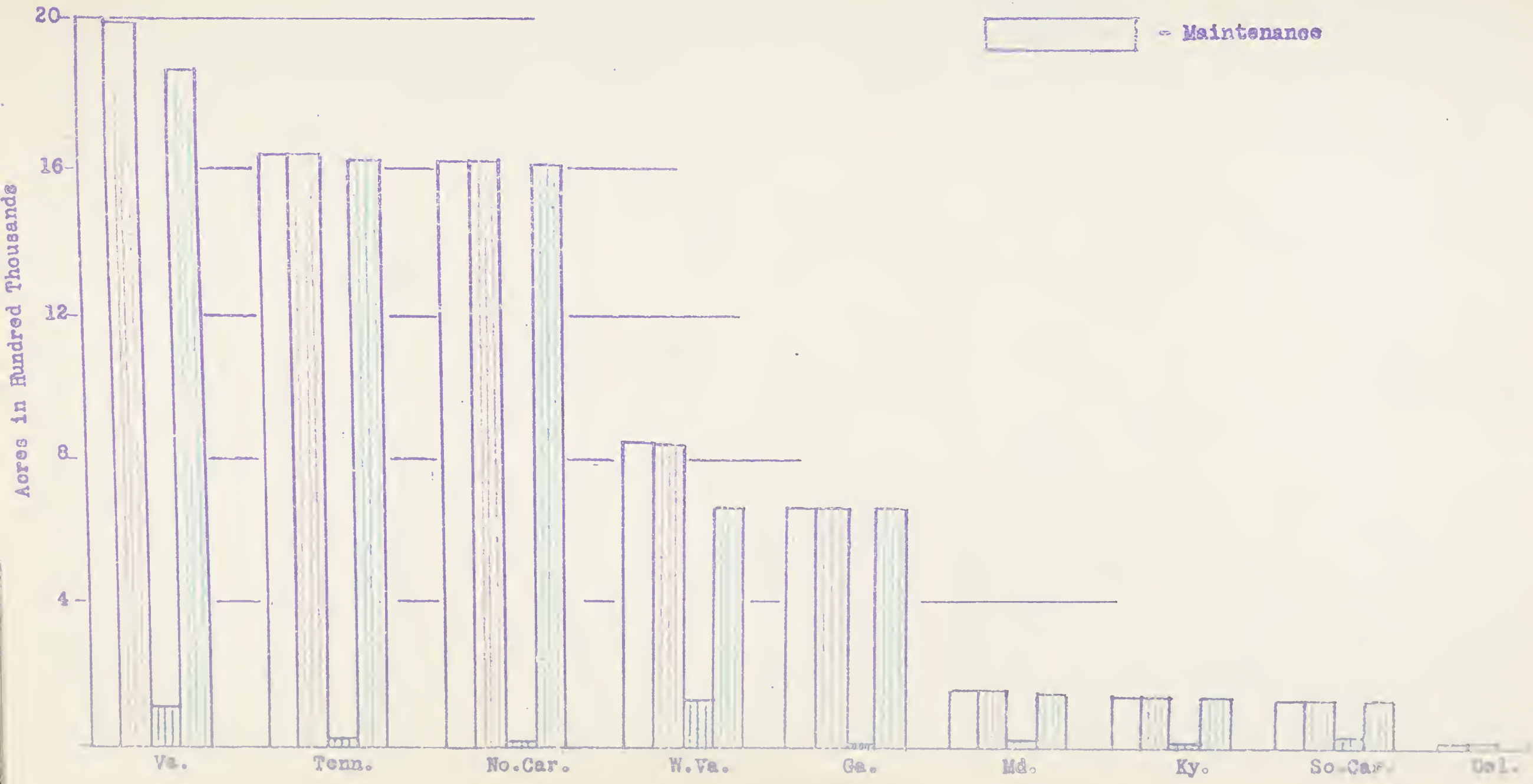
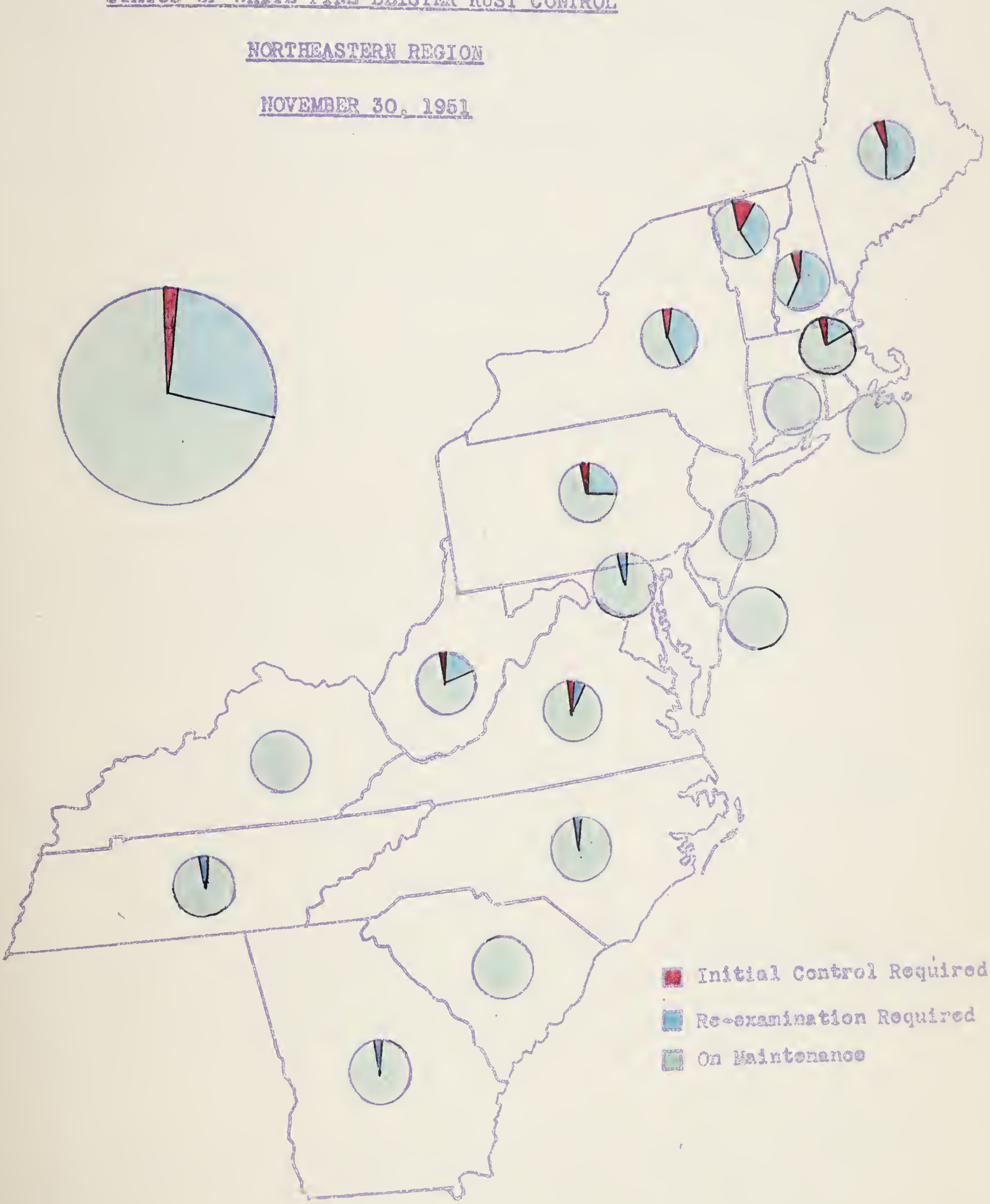


CHART V

STATUS OF WHITE PINE BLISTER RUST CONTROL

NORTHEASTERN REGION

NOVEMBER 30, 1951



HIGHLIGHTS OF 1951

Nearly a million acres (931,285) were cleared of 3,171,253 ribes as a result of 33,706 man-days of labor. Compared with 1950, there was a 17.1 percent reduction in man-days, but only a decrease of 7.7 percent in acreage worked. An average of 27.3 acres was worked per man-day in 1951 compared with 24.0 acres in 1950, or an increase of 11.0 percent.

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A total of 643,721 acres was placed on maintenance during 1951; now 70.9 percent of the total net control area is in this category compared with 66.6 at the end of 1950.

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The net control area in the Northeastern States was reduced by 151,489 acres.

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A total of 717,409 acres was detail-mapped and an additional 1,418,880 acres examined in connection with mapping.

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The prospects for the effective use of 2,4,5-T in the eradication of ribes under special conditions were indicated by the results of checks on 1950 spraying operations. There was evidence of complete effectiveness in the killing of American black currants and concentrations of skunk currants. Results with gooseberries, escaped red currants and flowering currants were not conclusive.

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Extremely heavy and general infection on ribes at least in the Northeastern States induced no doubt by the exceptionally heavy rainfall in August, indicated that 1951 may be a peak year in the spread of the rust to white pines.

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A complete analysis of the program since its inception, including accomplishments and future needs, was made by the office of the project leader for the committee appointed by the Secretary of Agriculture, to provide information for his use in advising the sub-committee on appropriations of the House of Representatives regarding the control programs of the Bureau.

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Gratifying evidence of increased interest in the blister rust control program by both public and private foresters was shown by the repeated reports of conferences by the federal leaders with foresters and pine owners. The effectiveness of informational and service activities was demonstrated conspicuously through the increased interest by foresters and owners in the salvage of rust-infected pines.

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Excellent support of the control program by the states and their local cooperators was demonstrated by direct aid funds for the fiscal year 1952 amounting to an all-time high of $358,555, an increase of $34,550 over fiscal year 1951. This increase resulted principally from the more than doubling of state appropriations (regular or special) in Maine, Vermont, Connecticut and West Virginia. The 1952 total represents $244,555 in excess of the Bureau allotment of $114,000 for ribes eradication work on state and private lands. Moreover, the combined Bureau allotments for federal leadership and ribes eradication totaling $305,300 was $53,255 less than the amounts pledged by the states and their local cooperators and $44,700 less than the total amount of Bureau money provided for fiscal year 1951.

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The blister rust project in Southern Appalachian States was incorporated into the Northeastern Region during August 1951. The administrative work of the Harrisonburg Office was transferred on July 1 to the administrative unit at the regional office at Greenfield. This latter change resulted in releasing four clerical workers at Harrisonburg and one at Mount Solon, Virginia. In conformity with departmental policy to centralize offices at state and county levels, a few changes were made in the headquarters of district leaders. All such men in New England also cooperated in the enforcement of the gypsy moth quarantine.

Table 2 Summary of Ribes Eradication 1951 - Northeastern States

First Working

Project	Acreage Worked	Total Ribes Destroyed	Total Man Days	Ribes Per Acre	Acres Per Man Day
State and Private	141,776	855,659	7,000	6.0	20.3
National Forests	275	5,845	65	21.3	4.2
National Parks	-	-	-	-	-
All Projects	142,051	861,504	7,065	6.1	20.1

Second Working

State and Private	360,568	1,124,493	11,178	3.1	32.3
National Forests	-	-	-	-	-
National Parks	-	-	-	-	-
All Projects	360,568	1,124,493	11,178	3.1	32.3

Other Workings

State and Private	379,165	630,754	7,941	1.7	47.7
National Forests	-	-	-	-	-
National Parks	-	-	-	-	-
All Projects	379,165	630,754	7,941	1.7	47.7

All Workings

State and Private	881,509	2,610,906	26,119	3.0	33.7
National Forests	275	5,845	65	21.3	4.2
National Parks	-	-	-	-	-
All Projects	881,784	2,616,751	26,184	3.0	32.4

Table 3 - Summary of Ribes Eradication 1951 - So. Appalachian States

First Working

Project	Acreage Worked	Total Ribes Destroyed	Total Man Days	Ribes Per Acre	Acres Per Man Day
State and Private	21,446 *	78,474	1,153	12.7	5.4
National Forests	57,995 **	132,610	1,026	37.4	3.5
National Parks	-	333	4	-	-
All Projects	79,441	211,417	2,183	21.7	4.5

Second Working

State and Private	6,623	104,156	962	15.7	6.9
National Forests	8,532	61,894	1,681	7.3	5.1
National Parks	-	10	1	-	-
All Projects	15,155	166,060	2,644	11.0	5.7

Other Workings

State and Private	3,224	69,716	669	21.6	4.8
National Forests	11,348	64,940	1,950	5.7	5.8
National Parks	333	2,369	76	7.1	4.4
All Projects	14,905	137,025	2,695	9.2	5.5

All Workings

State and Private	31,293 *	252,346	2,784	15.7	5.8
National Forests	77,875 **	259,444	4,657	11.1	5.0
National Parks	333	2,712	81	8.1	4.2
All Projects	109,501	514,502	7,522	12.9	5.3

* Includes 15,264 acres ribes-free
**Includes 54,445 acres ribes-free

Table 4 - Summary of Ribes Eradication 1951 - Region Totals

First Working

Project	Acreage Worked	Total Ribes Destroyed	Total Man Days	Ribes Per Acre	Acres Per Man Day
State and Private	163,222 *	934,133	8,153	6.3	18.1
National Forests	58,270 **	138,455	1,091	36.1	3.5
National Parks	-	333	4	-	-
All Projects	221,492	1,072,921	9,248	7.1	16.4

Second Working

State and Private	367,191	1,228,649	12,140	3.3	30.2
National Forests	8,532	61,894	1,681	7.3	5.1
National Parks	-	10	1	-	-
All Projects	375,723	1,290,553	13,822	3.4	27.2

Other Workings

State and Private	382,389	700,470	8,610	1.8	44.4
National Forests	11,348	64,940	1,950	5.7	5.8
National Parks	333	2,369	75	7.1	4.4
All Projects	394,070	767,779	10,635	1.9	37.1

All Workings

State and Private	912,802 *	2,863,252	28,903	3.2	31.1
National Forests	78,150 **	265,289	4,722	11.2	5.0
National Parks	333	2,712	81	8.1	4.2
All Projects	991,285	3,131,253	33,704	3.4	27.3

* Includes 15,264 acres ribes-free
** Includes 54,445 acres ribes-free

Table 5 - Total Federal and State Cooperative Expenditures For All Blister Rust Control Activities - Calender Year 1951 - Region*

State	Federal Funds				Total State Cooperative	Grand Total All Funds
	Total B.E. & P.Q.	Forest Service	Park Service	Total Federal		
Maine	$ 30,299	-	-	$ 30,299	$ 24,816	$ 55,115
N. H.	49,653	-	-	49,653	46,467	96,120
Vt.	25,428	-	-	25,428	11,364	36,792
Mass.	21,674	-	-	21,674	12,757	34,431
R. I.	-	-	-	-	1,988	1,988
Conn.	6,080	-	-	6,080	11,355	17,435
N. Y.	67,441	-	-	67,441	160,436	227,877
Penna.	25,514	548	-	26,062	18,577	44,639
Sub Total	226,089	548	-	226,637	287,223	513,860
Md.	1,359	-	-	1,359	1,296	2,655
No. Car.	5,893	1,597	6,217	13,707	2,807	16,514
Tenn.	2,881	182	-	3,063	2,483	5,546
Va.	26,489	48,487	4,778	79,754	12,973	92,727
W. Va.	15,781	13,684	-	29,465	3,976	33,441
Sub Total	52,403	63,950	10,995	127,348	23,535	150,883
Region	$278,492	$ 64,498	$10,995	$353,985	$311,295	$665,260

* Expenditures for federal salaries to Dec. 31, 1951; federal expenses and cooperative expenditures to November 30, 1951.

PART II.

LEADERSHIP, COORDINATION AND TECHNICAL DIRECTION - WORK PROJECT BLR-1-1

GENERAL STATEMENT

The Bureau of Entomology and Plant Quarantine is responsible for the leadership, coordination and technical direction of the program. During 1951 this related to cooperative control work on state and private lands in all the Northeastern States, except New Jersey, and in Maryland, North Carolina, Tennessee, Virginia and West Virginia in the Southern Appalachian States. It included also, work on National Forests in Pennsylvania, North Carolina, Virginia and West Virginia, and on National Parks in North Carolina and Virginia.

The regional project office in Greenfield, Massachusetts, provides the overall planning and coordinates the control activities into a uniform program. This involves the use of federal, state, county, town, city and private funds in a balanced operation to insure the performance of control work where, and when needed. In accordance with a cooperative agreement with each state, the services of technical personnel are provided by the Bureau to organize and supervise the work. In each state the official of the department or division responsible for blister rust control, has nominal charge of the program and is responsible for the formulation of state policy and the enforcement of state laws and regulations. In some instances the states furnish office space and other facilities. Through state authority, cooperation is extended to counties, cities, towns, organizations and individuals. Work on federal lands is administered by the Bureau under agreement with the U. S. Forest Service and the National Park Service.

Organization and Personnel

Progress was made during the year in making adjustments resulting from the regional reorganization which became effective in October, 1950. The administrative unit to handle all personnel, property and fiscal affairs of all Bureau activities in the new Northeastern Region began to function on July 1 in charge of H. C. Ameigh. While lacking adequate trained personnel, the unit functioned as effectively as possible. As a result of the loss of personnel due to the reorganization, the office of the Project Leader has been seriously handicapped in conforming with the repeated requests for conferences, preparation of plans of work, budgets, justification and other statements, and in making contacts with state and federal officials and inspecting field operations. The addition of the responsibility for the program in the nine Southern Appalachian States increased materially the work load. There is imperative need for an assistant project leader and a clerk-stenographer. With the loyal and capable service of Miss Claire A. Purcell, Secretary to the Project Leader and the earnest assistance of Glenn R. Allison, at a sacrifice of his duties as Area Leader, the efficiency of the office has been maintained. The service of C. C. Perry was of particular aid in connection with the preparation of statements, charts, etc. for the information of the special committee, appointed by the Secretary of Agriculture to appraise the control programs of the Bureau. Studies were made of funds needed to establish and maintain control of the rust in the region, cost of control in relation to pine values, need for continuing the program, non-federal cooperation, improvement in methods and

organization, and adequacy of state laws and their enforcement. Messrs. Yost and George were particularly helpful in supplying information regarding the program in the Southern Appalachian States. A special drive was made to dispose of obsolete equipment, list surplus equipment and reorganize items to be retained. New job descriptions were prepared and submitted by all supervisory employees.

The project has been involved in the commendable effort of the Department to house in one building, various agencies at the state or county level. Examples of this have included the transfer of the office of District Leader DeBerti of Pennsylvania into a building in Brookville occupied by PMA and SCS. A similar move in the case of District Leader Conner of New Hampshire is planned for January 1952 involving the transfer of his office from East Jaffrey to Keene. U.S.D.A. activities in St. Johnsbury, Vt. will be centralized in one building involving the transfer of District Leader Palmer. The district office in the Post Office Building in Concord, N. H. was closed in July, arrangements having been made to provide space for District Leader Newman in the office of the State Forestry Department.

On July 1, the administrative activities for the Southern Appalachian States conducted at Harrisonburg, Virginia, were taken over by the regional office in Greenfield, Mass. This resulted in the termination of the services of Mrs. Bernice Yeakle and Mrs. Audrey Franklin. Mr. Edward G. Schmidt was transferred to the regional office of the Bureau at Gulfport, Mississippi. In November, Miss E. Frances Gardner was transferred to the Bureau Stored Products Insect Investigations office in Washington, D. C. Miss Joyce L. Cramer accepted transfer to Washington, effective January 1952. Mr. Ralph W. Welch remained on LWOP throughout the year. Mr. Henry E. Yost, acting in charge of control work in the Southern Appalachian States during Mr. Ball's absence, was appointed regional leader in the area during February 1951.

Effective on July 1 the use of the three district leaders in Vermont on fire control was discontinued. The State of Vermont had been paying $1500 toward the salary of these leaders to offset the time they devoted to the informational phase of fire control work.

The names and assignments of the permanent personnel in the region on December 31, 1951 are shown in Chart VI.

CHART VI

PERMANENT BLISTER RUST CONTROL PERSONNEL IN NORTHEASTERN REGION - DECEMBER 31, 1951

REGIONAL OFFICE — GREENFIELD, MASS.
PROJECT LEADER — E. C. FILLER
ASST. PROJECT LEADER — (VACANT)

MAINE - NEW HAMPSHIRE
AREA LEADER
P. H. SIMMONDS

DISTRICT LEADERS

- CONCORD, N. H. — L. E. NEWMAN
  - CONWAY, N. H. — S. H. BOOMER
    - EAST JAFFREY, N. H. — S. D. CONNER
      - LACONIA, N. H. — W. S. CODMAN
        - LEBANON, N. H. — G. F. RICHARDSON
          - ROCHESTER, N. H. — R. E. CURTIS
- AUBURN, ME. — M. G. CALDERARA
  - BELFAST, ME. — H. G. BRADBURY
    - BRIDGTON, ME. — J. B. PIKE

MASS. - VT. - CONN. - R.I.
AREA LEADER
G. R. ALLISON

DISTRICT LEADERS

- GREENFIELD, MASS. — G. S. DOORE
  - WORCESTER, MASS. — E. M. BROCKWAY
- BELLOWS FALLS, VT. — F. H. ROSE
  - RUTLAND, VT. — M. R. MULHOLLAND
    - ST. JOHNSBURY, VT. — E. H. PALMER
- CANAAN, CONN. — A. V. MILLER
  - STAFFORD SPRGS., CONN. — W. J. SCHREIER

SO. APPALACHIAN STATES
AREA LEADER: H. E. YOST
ASST. AREA LEADER: J. R. GEORGE

DISTRICT LEADERS

- MT. SOLON, VA. — G. C. CRAMER
  - MONTEBELLO, VA. — M. Q. MILLER
    - HARRISONBURG, VA. — C. A. RODAMER
- LOST RIVER, W. VA. — C. M. FULTZ
  - PIPESTEM, W. VA. — G. E. KEATON
    - ARBORVALE, W. VA. — D. L. GILLISPIE
- ASHEVILLE, N. C. — W. A. STEGALL, JR.*

WILL ALSO SUPERVISE ANY CONTROL WORK IN SO. CAROLINA, GEORGIA AND TENNESSEE

NEW YORK - PENNSYLVANIA
AREA LEADER
Wm. CLAVE

DISTRICT LEADERS

- HARRISBURG, PENNA. — R. P. FATZINGER
  - BROOKVILLE, PENNA. — M. J. DEBERTI
    - WILLIAMSPORT, PENNA. — V. C. LILLEY
- BOONVILLE, N. Y. — T. P. WOOLSCHLAGER
  - GLOVERSVILLE, N. Y. — J. W. CHARLTON
    - KINGSTON, N. Y. — F. U. SIEVERS
      - MALONE, N. Y. — H. W. HOLCOMB
        - SARATOGA SPRGS., N. Y. — P. E. BARBER
          - WARRENSBURG, N. Y. — N. H. HARPP
            - ONEONTA, N. Y. — B. A. BEARDSLEY, COLLABORATOR

Informational and Service Activities

Informational and service work was carried on as heretofore by the area and district leaders to keep federal, state and local agencies and the general public fully informed about the disease, the importance of its control, the progress made toward attaining control, and to secure and maintain cooperative participation in the control program. This type of leadership activity is especially significant in Maine, New Hampshire, Vermont and Connecticut where towns assist in financing control work and in New York where counties add their financial support. The importance of this assistance is indicated by the fact that cities, towns, counties and individuals provided 26.5% of the direct-aid cooperative money in 1951. These funds added to the direct-aid state appropriations account for 45.4% of all money expended for the program in 1951.

Comparative figures for informational and service work for the entire region are not available because of the lack of 1950 data for the Southern Appalachian States. In the Northeastern States, due to reduction in number of leaders and other causes, there were sizeable decreases in all activities except for small increases in meetings, attendance at meetings and the number of persons instructed in the field. The following brief tabulation provides a comparison between 1950 and 1951 in the Northeastern States:

	1950	1951	% Increase or Decrease
Meetings Addressed.....	262	264	+0.8
Attendance at meetings.....16,	281	16,782	+3.1
News items published.....	197	158	-19.8
Demonstrations placed.....	99	72	-27.2
Initial interviews.....	5,156	4,304	-16.5
Follow-up calls.....	3,457	2,788	-19.4
Persons instructed in the field.....	2,735	2,754	+0.7

The scope of attending meetings broadened materially to include participation in the proceedings of Forest Practice Boards and Soil Conservation District Committees. During 1951 a new responsibility involved attendance at the official meetings of State and County Agricultural Mobilization Committees (formerly U.S.D.A. Councils) set up to bring about the highest possible degree of working coordination among the state and federal public agencies which administer agricultural programs and to secure the application of the knowledge, experience, facilities, and other capacities of the U.S.D.A. to the mobilization job. The Project Leader, Area Leader Clave and several of the District Leaders have devoted considerable time to this special assignment. Other meetings, as heretofore, have included those sponsored by Granges, Fish and Game organizations, Service organizations (Kiwanis, Lions, Rotary) and Parent Teacher Associations.

Instructional work with students at forestry schools was emphasized again. During 1951 this type of activity was performed at the University of Connecticut; University of New Hampshire; the State College of Forestry, State Ranger School and Paul Smith School in New York; and the Pennsylvania State College summer camp. Area Leader Clave reporting on this type of

activity comments enthusiastically as follows: "Student interest in blister rust demonstrations at all forestry colleges this spring was the greatest ever. It appears that more attention is being given to blister rust by instructors in connection with other studies."

Contacts were made with practicing foresters - federal, state, county, farm, soil conservation, extension and consulting - to enable them to more readily identify the disease and damage in all stages as an aid in the development of management plans, including salvage operations. Incidentally but importantly, the weekly activity reports of the district leaders have contained repeated reference to interviews involving the salvage of infected pines as a result of advice from both public and private foresters, demonstrating that progress has been made in developing a cooperative interest among foresters.

The series of blister rust motion picture films continued to be an important aid to successful informational work at high schools and at various meetings. Some leaders find slides useful in connection with talks. There were 224 showings of the films to an aggregate audience of 28,119 persons.

Details of the records of informational and service activities during 1951 are shown in Table 6.

Publications

The manuscript by P. L. Rusden titled "Blister Rust Damage to White Pines at Waterford, Vermont" was accepted for publication in the Journal of Forestry and is expected to appear in an early 1952 issue. A suggestion by C. C. Perry for a new popular leaflet titled "White Pine - Nature's Gift to the Northeastern States" is in tentative manuscript form. This leaflet is patterned after Leaflet PA-138 titled "Give Your White Pine a Chance" issued October 1950 for use in the Southern Appalachian States. The report of "Field Studies of Ribes Regeneration on Areas Affected by the New England Hurricane of 1938" by P. L. Rusden and C. C. Perry is in manuscript form awaiting decision as to best use of the material. Time has not permitted the recording and statistical analysis for purposes of a further progress report, of "spot infection" plot data collected by the district leaders during 1951. An item by District Leader DeBerti titled "Controlling Blister Rust in Pennsylvania" was published in Pennsylvania Forest and Waters Magazine.

Cooperation with Other Agencies

Reference has been made in a previous instance to the excellent cooperative relationships maintained between the blister rust control personnel and representatives of the numerous forestry and agricultural agencies in the various states. In connection with the centralization of departmental and Bureau activities, the opportunity for inter-office and field cooperation will increase. Forest Commissioner Merrill of Vermont has provided office space and facilities in his office in Montpelier for one of the Quarantine Inspectors. All blister rust leaders in New England were given instructions and materials for assisting in gypsy moth quarantine enforcement. These men will make inspections of small local shipments and issue certificates when they can perform such duties more conveniently than regular quarantine inspectors, if the latter are headquartered at other locations.

Table 6 - Summary of 1951 Informational and Service Activities of District Blister Rust Control Leaders - Region

Informational Activities

State	Meetings Addressed		No. Radio Talks	No. Items Published	No. Demonstrations Placed
	No.	Attendance			
Maine	35	1,543	-	23	15
N. H.	72	2,926	-	49	22
Vt.	34	1,350	-	22	12
Mass.	22	3,138	8	11	3
R. I.	2	9	-	-	2
Conn.	5	118	-	-	4
N. Y.	87	7,218	-	45	12
Penna.	7	480	-	8	2
Sub Total	264	16,782	8	158	72
N. Car.	39	253	-	2	5
Tenn.	-	-	-	-	1
Va.	7	47	-	-	9
W. Va.	36	328	-	13	6
Sub Total	82	628	-	15	21
Region-Total	346	17,410	8	173	93

Service Activities

State	No. Initial Interviews	No. Follow-up Calls	No. Individuals Instructed in Field
Maine	1,245	299	1,126
N. H.	513	747	394
Vt.	289	642	59
Mass.	770	47	70
R. I.	51	3	9
Conn.	226	38	27
N. Y.	1,046	977	841
Penna.	164	35	228
*Region-Total	4,304	2,788	2,754

* No record of Service Activities was made in the So. Appalachian States.

Close cooperation is maintained of course, with managing officials of the U. S. Forest Service and the National Park Service.

Expenditures on Project BLR-1-1

Expenditures on Project BLR-1-1 are summarized in Table 7.

Table 7 - Total Expenditures and Contributed Services For Work Project BLP-1-1 During Calendar Year 1951 - Region

State	Value of Contributed Services By States*	B. E. and P. Q. Expenditures (W-A.14)	Total
Maine	$ 865	$ 19,674	$ 20,539
N. H.	385	31,616	32,001
Vt.	860	17,540*	18,400
Mass.	830	16,652**	17,482
R. I.	159	-	159
Conn.	765	3,803	4,568
N. Y.	3,303	37,606	40,909
Penna.	960	15,531	16,491
Sub Total	8,127	142,422	150,549
Md.	-	843	843
No. Car.	250	5,513	5,763
Tenn.	-	2,397	2,397
Va.	643	23,613	24,256
W. Va.	-	15,104	15,104
Sub Total	893	47,470	48,363
Region	$ 9,020	$ 189,892	$ 198,912

* Includes $1,254 for wages L/A labor
** " $1,315 " " " "

Note: B. E. & P. Q. salaries to Dec. 31, 1951; B. E. & P. Q. expenses and value of contributed services to Nov. 30, 1951

PART III

COOPERATIVE BLISTER RUST CONTROL ON STATE AND PRIVATELY-OWNED LANDS
WORK PROJECT BLR-3-1

NORTHEASTERN STATES

GENERAL STATEMENT

The Bureau of Entomology and Plant Quarantine is responsible for over-all project planning and expends money appropriated by Congress under the provisions of the Lea Act for control work in cooperation with the states. These federal funds are allocated in participation with states, counties, cities, towns, associations and individual pine owners. In the Northeastern States section of the region, nearly 99.9% of the white pine in the control area is on state and privately owned lands.

The present net control area on such lands comprises 10,983,220 acres including 3,971,398 acres of white pine meeting quality and stocking requirements warranting protection. First working has been completed on 96.0% of the control area, 61.1% has been worked two or more times and 55% is now classified as being on maintenance. First work is still needed on 442,273 acres and an additional 4,494,922 acres which have been worked at least once in the past need examination and any necessary rework performed before the areas can be placed on maintenance.

State and Local Cooperative Expenditures

State funds were appropriated specifically for blister rust control in 1951 in Maine, New Hampshire, Massachusetts, Connecticut and New York, while in Vermont, Rhode Island and Pennsylvania allotments for the work were made from regular state appropriations for either general forestry or pest control projects. Additional funds were also allotted from state appropriations in Massachusetts, Connecticut and New York. Total state expenditures and contributed services for Project BLR-3-1 during 1951 amounted to $205,778 compared with $214,556 in 1950.

Town cooperation in Maine, New Hampshire, Vermont and Connecticut involved expenditures of $54,699 for cooperative ribes eradication work by 183 towns as compared with $64,221 by 185 towns in 1950.

County cooperation was restricted to New York where 19 counties spent $21,862 for control work. This compares with $22,043 in 1950.

Individuals expended $2,421 for specific control work on their holdings. These expenditures were made by 21 owners.

Table 8 summarizes the individual, town and county cooperation by states.

Table 8 - Local Cooperation on Blister Rust Control Work During 1951
Northeastern States

State	No. of Cooperators			Amount Expended			
	Indiv'ls.	Towns	Counties	Indiv'ls.	Towns	Counties	Total
Maine	-	53	-	-	$13,913	-	$ 13,913
N.H.	1	90	-	$ 403	33,885	-	34,288
Vt.	3	35	-	223	6,143	-	6,366
Mass.	17	-	-	1,795	-	-	1,795
Conn.	-	5	-	-	758	-	758
N.Y.	-	-	19	-	-	21,862	21,862
All States	21	183	19	$2,421	$54,699	$21,862	$ 78,982

During 1951 total state and cooperative expenditures and contributed services for Project BLR-3-1 amounted to $287,760, a decrease of 5.4%.

A summary of all state and local expenditures and the value of contributed services from 1942 to 1951 is shown in Table 9.

Table 9 - State and Local Cooperative Expenditures and Contributed Services (Direct Aid) For Project BLR-3-1 During Period 1942-1951, Inclusive - Northeastern States

Calender Year	States	Counties	Towns	Individuals	Total
1942	$ 47,628	$ 9,535	$ 15,601	$ 2,194	$ 74,958
1943	50,315	7,553	17,401	907	76,176
1944	56,307	11,537	17,687	834	86,365
1945	63,510	12,162	25,040	361	101,073
1946	137,859	15,367	31,415	4,615	189,256
1947	195,595	16,887	47,842	7,594	267,918
1948	235,301	17,064	54,146	4,013	310,524
1949	230,967	19,847	51,345	873	303,032
1950	214,216	22,043	64,222	3,572	304,053
1951	203,643	21,862	54,699	2,421	282,625
Total	$1,435,341	$ 153,857	$ 379,398	$ 27,384	$ 1,995,980

Control Area Examination and Mapping Work

Control area examination is designed to make certain that pine conditions meet quality and stocking standards to establish proper protection zone widths according to approved standards and to locate areas where logging, fire or wind have resulted in a menacing regrowth of ribes. Areas where pine meets standards warranting protection are mapped or remapped. During 1951, 4,094 man days were devoted to this dual activity which compares with the figure of 4,175 man days in 1950. The 599,243 acres mapped represents a decrease of 122,238 acres or 17.0%. The man-day records are not segregated into time devoted to examination and that involved in mapping. If, however, the acreages in the two activities are combined, the man-day production rate in 1951 amounted to 469.9 acres as compared with a figure of 518.1 in 1950.

In Maine, 112,177 acres were examined and 68,711 acres were mapped by scouts during the ribes eradication season and man days were charged to the eradication program. This work was necessary because of the insufficiency of funds to provide personnel during the fall and winter. It is hoped that part-time workers may be available in 1952 to avoid taking time from eradication work.

In New Hampshire, an effort was made to provide full-time personnel for use alternately as mappers in the fall and winter and scouts or foremen on eradication work. In line with this policy five mappers were employed during the fall and winter to speed up examination and mapping. In this connection a special effort was made also to eliminate some of the details heretofore recorded on control area maps in that state. As in previous years, several mappers were employed on state funds in New York during the fall and winter months.

In Pennsylvania, in particular, a revised mapping program with emphasis on the discontimuance of mature pine stands and sub-standard areas, and the reduction in widths of protection zones resulted in a 25% to 75% reduction in control acreage in some sections.

Many of the leaders in the Northeastern States reported surprising increases in white pine reproduction in fields, pastures and in blown down areas particularly in instances where no examinations had been made for from 5 to 10 years.

An aerial survey has been completed in Massachusetts and will be used as a basis for the Forest Survey of the state by the U. S. Forest Service. A new aerial survey in Connecticut is in progress with completion anticipated in January 1952. The U. S. Forest Service completed the Forest Survey of the State of New Hampshire and published the results.

The net reduction in total control area in the Northeastern States in 1951 was 151,489 acres with a net reduction of 35,432 acres in pine area.

The results of examination and mapping work in 1951 are summarized in Table 10.

Table 10 - Results of 1951 Control Area Examination and Mapping Work
Northeastern States

State	Acreage Detail Mapped			Additional Acreage Examined But Not Mapped			Total Man Days
	Initial Mapping	Re-mapping	Total	Inside Control Area	Outside Control Area	Total	
Maine	12,200	71,331	83,531	47,142	128,319	175,461	105
N. H.	91,926	26,156	118,082	95,919	126,896	222,815	1,048
Vt.	1,995	5,546	7,541	39,301	32,934	72,235	116
Mass.	7,490	42,886	50,376	212	98,463	98,675	77
R. I.	0	9,815	9,815	778	23,206	23,984	164
Conn.	0	49,711	49,711	628	197,896	198,524	286
N. Y.	49,932	188,713	238,645	217,667	235,775	453,442	1,932
Penna.	12,238	29,304	41,542	68,806	10,791	79,597	366
All States	175,781	423,462	599,243	470,453	854,280	1,324,733	4,094

GENERAL STATEMENT RE RIBES ERADICATION ON STATE AND PRIVATE LANDS

The results of 1951 ribes eradication work fell short of the accomplishments in 1950 and considerably less than requirements. This was due primarily to the appreciable reduction in available man days. This situation emphasizes the need for additional funds for this work.

Weather conditions in the spring were from 5 to 10 days ahead of a 19-year average with ribes sufficiently advanced at the opening of the field season on May 1. Excessive rains especially during August greatly handicapped control activities. Reports from one district in Maine show that absenteeism due to wet conditions and sickness was especially high.

Most of the district leaders experienced great difficulty in securing adequate and competent workers especially during May and June. One leader in New York candidly described the situation as follows: "Labor is very independent and difficult to obtain. Most of the men can secure higher rates of pay on other work and object to waiting for their state and federal pay checks. They claim they have to be paid every week in order to live under existing conditions. College and High School boys constantly change jobs for higher pay and better working conditions. I have never seen labor as independent and hard to manage as this year." Weekly reports from other district leaders support this statement. As a result of the unsatisfactory labor situation, particularly the turn-over, much time and effort was virtually wasted in attempting to train men only to have them leave after a short period of service.

To further complicate the situation, protracted state legislative sessions delayed the availability of funds for control work. New Hampshire had the longest legislative session in history, and in Massachusetts an all-time record was set with the Legislature sitting until November 17. In these states resolutions permitting continued expenditures were passed so that no great inconvenience resulted. In Pennsylvania however, no funds were available from June 1 to the end of the field season. In one district in that state arrangements were made to continue the services of a few men.

It is to the great credit of the district leaders that in spite of the difficulty in securing and retaining labor, excessive inclement weather, and reduction and uncertainty of funds, accomplishments continued at a high level of efficiency and effectiveness.

Wage Rates

In line with the general trend in wages in industry, state rates for labor were materially increased in 1951. In New York, all state employees were given a "cost of living" increase as of April 1 effective for one year amounting to 12½% of the first $2,000, plus 10% of the second $2,000 etc. The minimum increase was $300. In Massachusetts an increase of $360 per year for all state employees was retroactively effective on July 1 with an additional increase of $60 a year effective on Jan. 1, 1952. In New Hampshire pay rates were also increased.

The Regional Wage Board after careful review of a large amount of wage data submitted by the leaders for rates on work comparable to blister

rust control, recommended a schedule of 1951 rates to the Office of Personnel on March 16. This schedule did not meet necessary regulations as to geographical area and basic 1950 rates and was finally laboriously revised effective on April 30. The rates for federal L/A employees were finally established as follows:

Employee Unit	Laborer	Crew Leader	Foreman-Scout
(1) Massachusetts	$ 1.05	$ 1.20	$ 1.35
(2) New Hampshire	1.00	1.10	1.35
(3) Me., Vt., Conn., N. Y. and Pa.	1.00	1.10	1.25

In connection with L/A employment, a new form was devised prior to the field season combining on one sheet all necessary application-for-employment information, and appointment affidavit, including oath of office. Coincident with the issuance of this form a new appointment procedure was instituted whereby all new laborers, crew leaders, scouts and foremen were to be classified as intermittent and the appointment papers of such men to show that they are not entitled to earn leave. However, scouts who had been retained over winter and experienced scouts and foremen re-employed were to be granted leave privileges.

Temporary Personnel Employed on Control Work

The maximum number of workers employed by all agencies during the 1951 field season was 499. On federal W-E.14 funds the maximum number was 110 and the total number 167, indicating a considerable turnover during the season. Peak federal employment was in May in New York, in July in Pennsylvania, and during August in the other states. There were no federal W-E.14 workers in Connecticut or Rhode Island.

Table 11 - Temporary Personnel Employed on Control Work 1951 - Northeastern States

State	Maximum Number of Workers Employed by all Agencies	Federal Workers (W-E.14 Funds)		
		Maximum Number	Total Number	Period of Peak Employment (Week ending)
Maine	81	22	32	August 18
N. H.	93	11	17	August 4
Vt.	40	16	33	August 18
Mass.	22	4	7	August 18
R. I.	3	-	-	-
Conn.	12	-	-	-
N. Y.	194	45	63	May 25
Penna.	54	12	15	July 21
All States	499	110	167	-

Accomplishments in Ribes Eradication on State and Private Lands

During the 1951 field season, 2,610,906 ribes (wild and cultivated) were removed from 881,509 acres by 26,119 man days of labor. The percentage of total acreage, number of ribes and man-days in each state is outlined below:

State	% Total Acreage	% Total No. Ribes	% Total Man Days
Maine	16.4	13.3	14.2
New Hampshire	22.2	19.6	19.4
Vermont	5.7	7.5	7.8
Massachusetts	7.0	4.4	5.5
Rhode Island	1.3	0.1	0.6
Connecticut	6.4	0.8	1.7
New York	34.6	49.0	43.2
Pennsylvania	6.4	5.3	7.6

First work accounted for 16.1% of the total acreage worked, second work 40.9% and other workings(including maintenance workings) 43.0%.

Although the average number of ribes per acre was low, it results from the fact that there was a large acreage with low ribes population intermingled with denser populations in concentrations. Such a situation serves to reduce the average.

The production rate (acres per man day) amounted to 20.3 for first work, 32.3 for second work, 47.7 for other work, and 33.7 for all workings.

The results of eradication work on state and private lands are summarized in Table 12.

Table 12 - Ribes Eradication Work on State and Private Lands During 1951

Northeastern States

First Working

State	Total Acreage Worked	% Total For Each State	No. Ribes Destroyed		Total Man Days	Per Acre		Acres Worked per Man Day
			Wild & Cult.	Cult. Only		Ribes	Man Days	
Maine	16,222	11.4	61,882	48	651	3.8	.040	24.9
N.H.	18,666	13.2	86,880	280	814	4.7	.044	22.9
Vt.	30,939	21.8	140,458	202	1,398	4.5	.045	22.1
Mass.	9,447	6.7	25,283	352	288	2.7	.030	32.8
N.Y.	50,525	35.6	468,395	790	2,981	9.3	.059	16.9
Penna.	15,977	11.3	72,761	347	868	4.6	.054	18.4
All States	141,776	100.0	855,659	2,019	7,000	6.0	.049	20.3

Second Working

Maine	64,245	17.8	192,535	874	1,753	3.0	.027	36.6
N.H.	128,324	35.6	355,819	630	3,493	2.8	.027	36.7
Vt.	11,036	3.0	41,372	2	450	3.7	.040	24.5
Mass.	33,045	9.2	26,598	373	638	0.8	.019	51.8
N.Y.	98,290	27.3	466,887	125	4,153	4.8	.042	23.7
Penna.	25,628	7.1	41,282	27	691	1.6	.027	37.1
All States	360,568	100.0	1,124,493	2,031	11,178	3.1	.031	32.3

Other Workings

Maine	64,096	16.9	92,990	166	1,299	1.5	.020	49.3
N.H.	49,087	12.9	67,792	134	746	1.4	.015	65.8
Vt.	7,751	2.0	14,590	-	198	1.9	.026	39.1
Mass.	19,159	5.1	62,679	45	520	3.3	.027	36.8
R. I.	11,596	3.1	862	-	162	0.1	.014	71.6
Conn.	56,133	14.8	20,942	-	442	0.4	.008	127.0
N.Y.	156,198	41.2	345,019	65	4,150	2.2	.027	37.6
Penna.	15,145	4.0	25,880	7	424	1.7	.028	35.7
All States	379,165	100.0	630,754	417	7,941	1.7	.021	47.7

All Workings

Maine	144,563	16.4	347,407	1,088	3,703	2.4	.026	39.0
N.H.	196,077	22.2	510,491	1,044	5,053	2.6	.026	38.8
Vt.	49,726	5.7	196,420	204	2,046	4.0	.041	24.3
Mass.	61,651	7.0	114,560	770	1,446	1.9	.023	42.6
R.I.	11,596	1.3	862	-	162	0.1	.014	71.6
Conn.	56,133	6.4	20,942	-	442	0.4	.008	127.0
N.Y.	305,013	34.6	1,280,301	980	11,284	4.2	.037	27.0
Penna.	56,750	6.4	139,923	381	1,983	2.5	.035	28.6
All States	881,509	100.0	2,610,906	4,467	26,119	3.0	.030	33.7

Maintenance Workings

In the Northeastern States section of the region, records of work on maintenance areas are compiled separately under the designation - maintenance workings. All ribes eradication work in Connecticut and Rhode Island in 1951 was in this category. In the other states the amount is still relatively small ranging from only 0.6% of all work in Massachusetts to a maximum of 15.2% in Pennsylvania with a figure of 15.5 for the Northeastern States combined. The results of maintenance workings are shown in Table 13.

Table 13 - Maintenance Work on State and Private Lands During 1951
Northeastern States
(Data included in Table 12 in Other Workings)

State	Acreage Worked	No. Ribes Destroyed	Total Man Days	Per Acre		Acres Worked Per Man Day
				Ribes	Man Days	
Maine	5,686	7,735	84	1.4	.015	67.7
N. H.	14,932	12,144	196	0.8	.013	76.2
Vt.	469	2,372	22	5.1	.047	21.3
Mass.	391	0	5	0	.013	78.2
R. I.	11,596	862	162	0.1	.014	71.6
Conn.	56,133	20,942	442	0.4	.008	127.0
N. Y.	38,460	78,986	1,041	2.1	.027	36.9
Penna.	8,626	11,178	238	1.3	.028	36.2
All States	136,293	134,219	2,190	1.0	.016	62.2

Comparison of 1950 and 1951 Ribes Eradication Results

A comparison of the results of 1951 ribes eradication work with that of 1950 shows that with a reduction of 19.0% in available man days, there was only a decrease of 7.7% in acreage covered. Significantly, there was a decrease of 34.8% in the number of ribes destroyed.

So many factors enter into production rates it is futile to compare rates in the several states. A comparison, however, based on the large unit of acreage represented by the aggregate volume of work is a reasonably satisfactory basis to determine trends. For the Northeastern States production rates are shown below for 1950 and 1951 by numerical working:

Production Rate (Acres Worked per Man Day)

	First Work	Second Work	Other Work	All Work
1950	18.6	27.8	44.8	29.6
1951	20.3	32.3	47.7	33.7
Increase 1951	9.1%	16.2%	6.5%	13.9%

These figures indicate that in addition to the effect of the reduction in unit ribes population, the greater use of scouts where competent men are available and the use of smaller crew units is resulting in a commendable increase in production rates.

Checking Ribes Eradication Work

Three procedures are used in checking ribes eradication work in the Northeastern States: these are (1) obeervations by the foreman as he works with the field unit and virtually examines the ground covered by the unit, (2) rework of a portion of a strip by the field unit, and (3) measured general checks of worked area by the district leader or checker. In addition, supervisory personnel make general inspection of worked areas and observe the functioning of the field units to make certain that proper procedures are being used.

The district leaders and checking personnel spent 3,571 hours making 2,190 measured checks in worked areas. An average of 7.9 feet of live stem per acre was found on this type of checking. Table 14 summarizes the results by states.

As indicated in the 1950 report, the system of measured checking requires review to determine its value at the present time and to insure more uniform use of the procedure. Measured general checking is time consuming. Where leaders have assistants for the purpose as in New York, a substantial number of checks may be made. In 1951, New York reported 1,063 checks covering 0.62% of the worked area contrasted with Maine at the other extreme with 86 checks representing only 0.06%. There was notable increase in the number of checks made in New Hampshire where scouts assisted in this work. In the matter of percentage of work approved, the situation is confused and rather definitely indicates a lack of uniformity in the application of the system by the district leader personnel. It is a fact that with the decreasing ribes population, the need for measured checking becomes of less importance and reliance can be placed on spot or general supervisory checking especially in areas where no crew work was necessary.

Table 14 - Results of Measured General Checks of 1951 Ribes Eradication Work Northeastern States

State	No. Checks	Hours Checking	Acres in Strip Checks	No. Ribes Found on Checks	Ribes Live Stem Found on checks		Control Work	
					Total F.L.S.	F.L.S. per Acre	Approved	Dis-approved
Maine	104	111	86	224	365	4.2	100	4
N.H.	419	578	553	868	2,136	3.9	404	15
Vt.	172	213	215	701	2,133	9.9	163	9
Mass.	236	343	310	813	1,703	5.5	234	2
R. I.	-	-	-	-	-	-	-	-
Conn.	48	108	113	308	1,758	15.5	41	7
N. Y.	1,063	2,021	1,906	6,536	17,318	9.1	993	70
Penna.	148	197	169	445	1,082	6.4	135	13
All States	2,190	3,571	3,352	9,895	26,495	7.9	2,070	120

Automotive Equipment

At the end of 1951, federally-owned automotive equipment in this region included 55 trucks and 34 passenger-carrying vehicles as follows:

Year of Manufacture	Trucks (All Half-Ton) Pick-Ups	Sedan Deliveries	Suburban Carry-All	Passenger Cars Coaches	Sedans
1935.....	5	-	-	-	-
1936.....	7	-	-	-	1
1939.....	2	2	1	-	-
1940.....	-	-	-	1	-
1941.....	-	-	-	1	1
1942.....	-	2	-	4	-
1947.....	32	-	-	-	4
1948.....	-	-	-	4	-
1949.....	2	-	-	-	14
1950.....	-	-	-	-	4
1951.....	2	-	-	-	-
Total.....	50	4	1	10	24

Additional vehicles during 1951 included the following:
2 - 1936 Ford Pick-ups, transferred from Gypsy Moth Control Project
2 - 1951 Chevrolet Pick-ups, purchased
1 - 1947 Plymouth Sedan, transferred from Southern Appalachians

Vehicles disposed of during 1951 included:
4 - 1935 Dodge Pick-ups, sold
1 - 1936 Ford Pick-up, sold
1 - 1939 Ford Pick-up, sold

Vehicles transferred as surplus to state agencies included:
4 - 1935 Dodge Pick-ups
1 - 1939 Plymouth Pick-up

Chemical Eradication of Ribes

There was an increased use of 2,4,5-T as a ribicide in the several states with rather promising results. The transfer of 30 spray pumps from the Gypsy Moth Control project was helpful in making additional tests during 1951. The records of 1950 applications in New York indicate that the chemical can be used effectively on American black currants and skunk currant concentrations. The results with gooseberries, however, were less effective and will require further experimental applications. Experience thus far indicates that care must be exercised to spray thoroughly especially where dense brush is involved. To aid in securing more adequate coverage, an effort is being made to procure colored spray material that will show a residue on the foliage.

Injuries to Temporary Federal L/A Employees

A total of 167 temporary workers was employed on federal L/A funds. None of these workers sustained injuries while on duty that necessitated medical services or resulted in lost time. This record compares with injuries to five workers during 1950.

State Compensation For Cultivated Ribes Destroyed During 1951

It was not necessary for the states to compensate any of the owners of the 4,467 cultivated ribes destroyed in connection with the 1951 control activities. Table 39 in the Appendix lists information on cultivated ribes compensation for all years.

Nursery Sanitation Work During 1951

Sanitation work was performed in the environs of 5 nurseries in Connecticut, New York, and Pennsylvania. A total of 21 man days was spent examining 3,539 acres and 809 wild ribes were located and destroyed. There were 7,205,000 white pines in the 5 nurseries worked.

The following table summarizes the results of the 1951 nursery sanitation work by states, while Tables 35 and 36 in the Appendix show the accumulative accomplishments and the present status of such activities.

Table 15 - Nursery Sanitation Work During 1951 - Northeastern States
(All Rework)

State	No. Nurseries Worked	Est. No. White Pines in Nurseries Worked	Acreage Worked	No. Ribes Destroyed (All Wild)	Total Man Days	No. Ribes per Acre	Acres Worked Per Man Day
Conn.	1	50,000	188	0	1	0	188.0
N. Y.	3	5,655,000	2,985	809	17	0.3	175.6
Penna.	1	1,500,000	366	0	3	0	122.0
Totals	5	7,205,000	3,539	809	21	0.2	168.5

Blister Rust Canker Elimination Work During 1951

Blister rust canker elimination during the current year was restricted to state lands in 8 towns in New York where the pines had high aesthetic value. A total of 11,661 white pines was examined and 435 fatally diseased trees were cut down. In addition, 1670 branch infections and 184 stem cankers were removed from 1402 other pines. A total of 92 man days was used in canker elimination work.

Status of Control Work on State and Private Lands

As of November 30, 1951, the control area on state and private lands amounted to 10,983,220 acres of which 3,971,398 acres represents stands of white pine meeting standards warranting continued control. First working has been performed on 96% of the control area and second working on 61.1%. The 6,046,025 acres on maintenance amounts to 55.0% of the total and includes all of the control area in Connecticut, Rhode Island and New Jersey. The 1951 net increase in area on maintenance was 643,721 or 11.9%.

Detailed mapping has been completed on 80.9% of the control area but many of the original maps are rather obsolete because of changes resulting from hurricanes, large fires, and extensive logging. Control area mapping and remapping during 1951 resulted in further reductions in the control area and white pine acreages. The net control area dropped 151,489 acres and the net pine area was reduced by 35,432 acres.

Table 16 shows the present status of control work in each of the Northeastern States.

The net changes in both control area and pine area are indicated below:

	Control Area Acreage		White Pine Acreage	
	Decreases	Increases	Decreases	Increases
Maine	43,113	-	18,936	-
N. H.	57,106	-	23,656	-
Vt.	-	9,573	-	4,955
Mass.	-	9,284	-	8,741
R. I.	-	62	-	529
Conn.	-	15,945	-	3,842
N. Y.	50,535	-	6,424	-
Pa.	35,599	-	4,483	-
Northeastern States Total	-151,489		-35,432	

These figures show that the reductions in both control area and white pine area in the Northeastern States as a group were slightly reduced by increases in Vermont, Massachusetts, Rhode Island and Connecticut.

Aside from these acreage changes in control area and pine area there was an increase of 1.8% in area detailed mapped, a 0.7% increase in the area worked once, 2.8% increase in area worked twice and an appreciable increase of 6.4% in the acreage in the maintenance classification. The greatest change in the item of maintenance was in Pennsylvania with an increase of 10.8%, then Vermont with 8.7%, New Hampshire with 7.9%, New York with 7.2%, and Maine with 5.5%.

Table 16 - Status of Blister Rust Control Work on State and Private Lands - Northeastern States

November 30, 1951

State	Total Acreage of Net Control Area	Acreage of White Pine	Acreage Detail Mapped	Net Acreage Worked				Acreage on Maintenance	Percentage of Net Control Area			
				Pre-Maintenance Work			All Maintenance Work					
				First Work	Second Work	Other Workings			Detail Mapped	Worked Once	Worked Twice	On Maintenance
Maine	2,381,600	932,497	2,145,899	2,236,763	1,408,168	278,103	25,019	1,119,323	90.1	93.9	59.1	47.0
N.H.	2,747,412	1,242,535	1,711,055	2,689,357	1,385,140	168,835	26,456	1,034,184	62.3	97.9	30.4	37.6
Vt.	728,528	168,264	721,459	595,278	211,496	39,455	3,228	406,709	99.0	81.7	29.0	55.8
Mass.	1,552,258	593,960	1,100,823	1,526,726	1,173,090	154,436	1,766	1,219,947	70.9	98.4	75.6	78.6
R.I.	142,460	61,329	142,460	142,460	136,072	34,068	78,426	142,460	100.0	100.0	95.5	100.0
Conn.	465,490	90,951	465,490	465,490	305,858	129,643	323,790	465,490	100.0	100.0	65.7	100.0
N.Y.	2,430,667	767,066	2,088,250	2,372,673	1,778,110	872,251	342,874	1,251,986	85.9	97.6	73.2	51.5
N.J.	16,742	3,771	-	16,742	1,417	-	-	16,742	0	100.0	8.5	100.0
Penna.	518,063	111,025	506,458	495,458	313,808	68,905	51,117	389,184	97.8	95.6	60.6	75.1
All States	10,983,220	3,971,398	8,881,894	10,540,947	6,713,159	1,745,696	852,676	6,046,025	80.9	96.0	61.1	55.0

Table 17 - Control Work Needed on State and Private Lands - Northeastern States
(As of November 30, 1951)

State	Total Acreage of Net Control Area	Acreage in Net Control Area in Need of			Percentage of Net Control Area in Need of		
		Initial Detail Mapping	Pre-Maintenance Work		Initial Detail Mapping	Pre-Maintenance Work	
			First Work	Rework		First Work	Rework
Maine	2,381,600	235,701	144,837	1,117,440	0.9	6.1	46.9
N. H.	2,747,412	1,036,357	58,055	1,656,173	37.7	2.1	60.3
Vt.	728,528	7,069	133,250	188,569	1.0	18.3	25.9
Mass.	1,552,258	451,435	25,532	306,779	29.1	1.6	19.8
R. I.	142,460	-	-	-	0	0	0
Conn.	465,490	-	-	-	0	0	0
N. Y.	2,430,667	342,417	57,994	1,120,687	14.1	2.4	46.1
N. J.	16,742	16,742	-	-	100.0	0	0
Penna.	518,063	11,605	22,605	106,274	2.2	4.4	20.5
All States	10,983,220	2,101,326	442,273	4,494,922	19.1	4.0	40.9

In Table 17 showing the control needs, the figure of 2,101,326 acres needing initial mapping emphasizes the fact that mapping is an important element in the work load of the project especially in view of the circumstance that re-mapping will be needed on that portion of the area on maintenance where ribes regenerate. As previously pointed out, the figure representing acreage in need of initial mapping is somewhat excessive, in that it includes substantial acreage in some states already on maintenance.

The acreage requiring first work has been reduced each year but with new acreages of reproduction reported in remapping activities, the figure of 442,273 acres is still sizeable. The largest acreages needing first work are in Vermont where they represent 18.3% of the control area in the state. In both New York and Pennsylvania appreciable reductions in this item were made in 1951.

The major work load is represented by the 4,494,922 acres requiring rework and the need for the examination of the extensive areas in the maintenance classification in accordance with the ten-year examination-interval policy. An analysis of the results of recent examination work in New York, indicates that about 15% of the maintenance areas will require rework.

Expenditures for Project BLR-3-1

State and local cooperative expenditures (direct aid) for Project BLR-3-1 during 1951 totalled $282,088 a decrease of 7.2% as compared with 1950. The following tabulation gives a comparison of such cooperative expenditures in each state during the last two years:

State and Local Cooperative Expenditures for Project BLR-3-1

State	1950	1951	Percentage Change
Maine.....	$ 23,779	$ 24,316	-2.3
N. H.....	55,678	46,192	-17.0
Vt.....	9,345	10,874	+16.5
Mass.....	13,750	12,757	-7.2
R. I.....	2,206	1,828	-17.1
Conn.....	13,428	10,745	-20.0
N. Y.....	157,931	157,686	-0.2
Penna.....	27,936	18,227	-34.8
Total	$304,053	$282,625	-7.0

The expenditures in New York and Maine were practically the same as in 1950 but in all other states except Vermont there were decreases. In Vermont there was an increase of 16.5%. The decreases were not due to failure to provide funds but rather to a delay in their availability for expenditure. In Pennsylvania, as previously related, no funds were available for expenditure after July 1 for the remainder of the field season. In New Hampshire, uncertainty about funds resulted in some hesitancy in continuing activities and then when funds were available, it was too late to increase operations. In that state some funds were reserved for the employment of mappers during the winter.

For the fourth consecutive year, there was a decrease in federal expenditures for Project BRL-3-1. Such expenditures in 1951 amounted to only $83,667 as compared with $113,528 in 1950, $146,381 in 1949, $157,744 in 1948 and $300,317 in 1947 or a decrease of 72.1% in 1951 compared with 1947. On the other hand, direct aid by the states and their cooperators jumped from $267,918 in 1947 to $310,524 in 1948, $303,033 in 1949, $304,053 in 1950 and dropping somewhat to $282,625 during the current year. As indicated in the tabulation below, direct aid by the states and their cooperators in 1951 exceeded federal expenditures in all states.

Expenditures for Project BLR-3-1 During Calendar Year 1951

State	Federal	States and Local Cooperators (Direct Aid)	Total	% Total By Federal	% Total By States and Local Cooperators
Maine.....	$ 10,625	$ 24,316	$ 34,941	30.4	69.6
N. H.....	18,037	46,192	64,229	28.1	71.9
Vt.....	7,888	10,874	18,762	42.0	58.0
Mass.....	5,022	12,757	17,779	28.2	71.8
R. I.....	-	1,828	1,828	-	100.0
Conn.....	2,277	10,745	13,022	17.4	82.6
N. Y.....	29,835	157,686	187,521	15.9	84.1
Penna.....	9,983	18,227	28,210	35.4	64.6
Total	$ 83,667	$282,625	$366,292	22.9	77.1

N.E. States

The difference between expenditures by the Bureau and by the States and local cooperators was the greatest again in New York where the direct aid total of $157,686 was 428.2% more than federal W-E.14 expenditures in that state and even more than the federal W-E.14 expenditures in all the Northeastern States combined.

The following table lists all expenditures and contributed services for Project BLR-3-1, by states, during 1951.

Table 18 - Total Expenditures and Contributed Services for Work Project BLR-3-1 During Calendar Year 1951

Northeastern States

State	State and Local Cooperative Expenditures								B.E. & P.Q. (W.E-14)	Grand Total
	Cash Expenditures					Value of Contributed Services		Total		
	State Funds	Towns	Counties	Indiv.	Sub-Total	State	Indiv. & Counties			
Maine	$ 10,403	$ 13,913	-	-	$ 24,316	$ 500	-	$ 24,816	$ 10,625	$ 35,441
N.H.	11,904	33,885	-	$ 403	46,192	275	-	46,467	18,037	64,504
Vt.	4,508	6,143	-	223	10,874	490	-	11,364	7,888	19,252
Mass.	10,962	-	-	1,795	12,757	-	-	12,757	5,022	17,779
R.I.	1,828	-	-	-	1,828	160	-	1,988	-	1,988
Conn.	9,987	758	-	-	10,745	610	-	11,355	2,277	13,632
N.Y.	135,824	-	21,862	-	157,686	2,750	-	160,436	29,835	190,271
Penna.	18,227	-	-	-	18,227	350	-	18,577	9,983	28,560
All States	$203,643	$54,699	$21,862	$2,421	$282,625	$ 5,135	-	$287,760	$ 83,667	$371,427

* Does not include $2,569 W-a funds for L/A labor in Mass. and Vt.

PART III (Continued)

COOPERATIVE BLISTER RUST CONTROL ON STATE AND PRIVATELY-OWNED LANDS

SOUTHERN APPALACHIAN STATES

GENERAL STATEMENT

In contrast to the situation in the Northeastern States, 26.2% of the lands in the net control area in the Southern Appalachian States are in federal ownership that is in National Forests, National Parks and the Indian Service. The 73.8% in state and private ownership comprises a control area of 5,356,697 acres of which 2,259,310 acres contain white pine. First working has been completed on 99.3% of the control area, 4.0% has been worked twice and 94.7% is in the maintenance classification. First work is needed on only 35,021 acres and possible rework on 249,222 acres which have been worked at least once and may need further work before being placed on maintenance.

State and Local Cooperative Expenditures

Local cooperation in the Southern Appalachian States is restricted largely to work with state funds supplemented by an occasional private contribution. In other words, towns, cities and counties do not participate actively as in the Northeastern States. Expenditures by state and local agencies during 1951 are shown below:

State	Local Cooperators Amt. Expended	State Agency Amt. Expended	Total Cooperative Expenditures
Maryland	-	$ 996	$ 996
No. Carolina	-	2,207	2,207
Tennessee	-	2,423	2,423
Virginia	$ 276	11,997	12,273
West Virginia ...	-	3,926	3,926
Total	$ 276	$ 21,549	$ 21,825

White Pine Surveys

Control area examination and mapping is referred to as Survey Work in the Southern Appalachian States and is performed on the grid system rather than the land-block basis. This is necessary because of the lack of sufficient roads to subdivide lands into reasonably small units such as is possible in most sections of the control area in the Northeastern States. Moreover the grid system is appliable in the Southern Appalachian States because the white pine meeting standards occurs in mixture and as an understory so that a count of pine can be made on long strips and over a large area. This is in contrast with conditions in the Northeastern States where pine occurs in scattered woodlots rather than over continuous areas.

The results of the 1951 survey work are summarized as follows:

No. Grids Surveyed	359
Acres of White Pine Surveyed	48,883
Acres of Control Area Surveyed	136,681
Man Days on Survey	642
Average Acres per Man Day	213

(These figures include surveys on all land ownerships)

The control area surveyed decreased 27% as compared with 1950, but the average coverage per man day was up 74%. This rate of coverage made it possible to complete survey work on the most essential areas. Funds that could well have been used on survey work were conserved for ribes eradication.

Wage Rates

The federal hourly wage rates on cooperative and Forest Service projects were: Foremen $1.15, Crew Leaders 95 cents and Laborers 85 cents. Park Service projects averaged slightly higher.

Temporary Personnel Employed on Control Work

During 1951, the maximum number of workers employed by all agencies was 190. The total number of federal L/A employees was 144.

Table 19 - Temporary Personnel Employed on Control Work 1951
So. Appalachian States

State	Maximum Number of Workers Employed by all Agencies	Total Number Federal L/A Workers
Md.	10	6
No. Car.	15	7
Tenn.	5	2
Va.	119	88
W. Va.	41	41
All States	190	144

Accomplishments in Ribes Eradication on State and Private Lands

The principal activity in 1951 on state and private lands was in Virginia and West Virginia. During the field season, 252,346 ribes were removed from 31,293 acres by the use of 2,784 man-days of labor. The percentage of total acreage, number of ribes and man-days in each state is outlined below:

State	% Total Acreage	% Total No. Ribes	% Total Man Days
Maryland	2.9	16.3	6.3
No. Carolina	.7	.5	1.7
Tennessee	2.9	8.9	9.2
Virginia	81.9	41.7	62.7
West Virginia	11.6	32.6	19.6

First work amounted to 68.5% of the total acreage covered, second work 21.2% and other workings 10.3%. The records of maintenance workings are not kept separately in the Southern Appalachian States.

The average number of ribes per acre for first work was 12.7, with 15.7 for second working and 21.6 for other workings with an average of 15.7 for all work combined. In connection with these ribes per acre figures, it is important to point out that in the Southern Appalachian section of the region extensive ribes-free acreages occur and are included in the total control area. These acreages are not included however, for purposes of calculating either ribes per acre or man days per acre. In 1951, on state and private lands in the Southern Appalachian States an area of 15,264 acres in the ribes-free area classification is included in the grand total of 31,293 acres covered during 1951. In other words units per acre are based on the 16,029 acres of ribes-bearing lands. This materially affects per acre values as compared with practice in the Northeastern States where considerable low ribes populated acreage covered by scouts is included in the totals thus materially reducing the averages. There is the further fact that in the Southern Appalachian States through post-checking, extensive acreages are excluded from crew work thus concentrating the work in relatively small areas with resultant increase in the factors of ribes and man days per acre. Man days on post-checking are not charged to ribes eradication.

The production rate (acres per man day) amounted to 5.4 for first work, 6.9 for second work, 4.8 for other workings and an average of 5.8 for all workings. Here again, the average cannot be compared with that in the Northeastern States because of the influence of the post-checking procedure and the ribes-free acreage situation.

Since post-checking is an integral phase of ribes eradication work, the results of this activity are shown below:

Acres covered	21,740
Man Days	325
Acres per Man Day	66

(These figures relate to all land ownerships)

The results of 1951 ribes eradication on state and private lands in the Southern Appalachian States are summarized in Table 20.

Table 20 - Ribes Eradication Work on State and Private Lands During 1951

(Southern Appalachian States)

FIRST WORK

State	Total Acreage Worked	No. Ribes Destroyed		Total Man Days	Per Acre		Acres Worked Per Man Day
		Wild & Cult.	Cult. only		Ribes	Man Days	
Md.	-	-	-	-	-	-	-
No.Car.	50	249	-	10	5.0	.200	5.0
Tenn.	181	6,196	-	32	34.2	.177	5.7
Va.	21,215*	72,029	-	1,111	12.1	.186	5.3
W. Va.	-	-	-	-	-	-	-
All States	21,446	78,474	-	1,153	12.7	.187	5.4

SECOND WORK

Md.	737	15,641	-	132	21.2	.179	5.6
No.Car.	-	-	-	-	-	-	-
Tenn.	-	-	-	-	-	-	-
Va.	3,376	7,938	-	430	2.4	.127	7.9
W. Va.	2,510	80,577	-	400	32.1	.159	6.3
All States	6,623	104,156	-	962	15.7	.145	6.9

OTHER WORKINGS

Md.	184	25,432	-	57	138.2	.309	3.2
No.Car.	179	910	-	36	5.1	.201	5.0
Tenn.	728	16,178	-	225	22.2	.309	3.2
Va.	1,028	25,334	-	205	24.6	.199	5.0
W. Va.	1,105	1,862	-	146	1.7	.132	7.6
All States	3,224	69,716	-	669	21.6	.208	4.8

ALL WORK

Md.	921	41,073	-	189	44.6	.205	4.9
No.Car.	229	1,159	-	46	5.1	.201	5.0
Tenn.	909	22,374	-	257	24.6	.283	3.5
Va.	*25,619	105,301	-	1,746	10.2	.168	5.9
W. Va.	3,615	82,439	-	546	22.8	.151	6.6
All States	*31,293	252,346	-	2,784	15.7	.173	5.8

* Includes 15,264 acres ribes-free area

Checking Ribes Eradication Work

Checking in the Southern Appalachian States is accomplished through systematic sampling and general examination. The tendency has been where ribes population is low at the time of eradication and where experienced men are employed, to rely upon general examinations rather than systematic sampling. This general method lends itself very well to situations where ribes occur on specific sites and on a relatively small percentage of the total control area. The acreage checked in 1951 was 59% less than in 1950.

The results of regular checking for all states combined are indicated below:

Acres Covered	21,740
Man Days Used	247
Acres per Man Day	69

(These figures include checking on all land ownerships)

Automotive Equipment

The following vehicles were on hand on December 31, 1951.

Year of Manufacture	Trucks Pick-Ups	Trucks Sedan Deliveries	Trucks Suburban Carry-All	Trucks Panel	Trucks Stakeside	Trucks Ambulance	Passenger Cars
1939	-	-	-	-	1	-	-
1942	-	-	-	-	-	4	-
1947	-	4	-	14	-	-	1
1948	1	-	-	-	-	-	1
1950	-	3	2	-	-	-	1
Total	1	7	2	14	1	4	3

There were no additions to the fleet during 1951. One passenger car was transferred to Greenfield while one stakeside truck and one panel truck were released as surplus to County School Boards through the Agricultural Equipment Committee.

Chemical Eradication of Ribes

The results of 1950 spraying with a 3% solution of 2,4-D and 2,4,5-T in diesel oil and kerosene on R.curvatum showed that many of the plants were not killed and produced sprouts in the spring of 1951. Additional applications on R.curvatum were made during June 1951 using a heavy dosage applied to the canes. The results will be watched with interest.

Injuries to Temporary Federal L/A Employees

There was only one injury during the year. This was the result of an insect bite, possibly a poisonous spider. No compensation or lost time was involved.

State Compensation for Cultivated Ribes Destroyed During 1951

No compensation was paid for cultivated ribes and none since the work in the section was inaugurated.

Nursery Sanitation Work During 1951

Sanitation work was performed in the environs of two nurseries in North Carolina involving work on 900 acres and the removal of 29 cultivated ribes. There were a million white pines in the two locations.

Status of Control Work on State and Private Lands

As of November 30, 1951, the control area on state and private lands amounted to 5,356,697 of which 2,259,310 acres represent white pine stands warranting protection. First working has been performed on 99.3% of the control area and second working on 4.0%. The area on maintenance amounts to 5,072,454 or 94.7% of the entire control area. This contrasts with a figure of only 55.0% for the Northeastern States.

Status details by states are shown in Table 21.

Table 21 - Status of Blister Rust Control Work on State and Private Lands

Southern Appalachian States

(As of November 30, 1951)

State	Total Acreage of Net Control Area	Acreage of White Pine	Net Acreage Worked			Acreage on Maintenance	Percentage of Net Control Area		
			First Work	Second Work	Other Working		Worked Once	Worked Twice	On Maintenance
Del.	6,186	242	6,186	-	-	6,186	100.0	-	100.0
Ga.	324,452	248,576	324,452	678	441	324,302	100.0	0.2	99.9
Ky.	114,312	31,199	114,312	-	-	114,312	100.0	-	100.0
Md.	163,590	70,550	163,590	16,433	27,378	152,227	100.0	10.0	93.1
N.Car.	1,361,532	581,619	1,361,532	6,631	2,495	1,358,872	100.0	0.5	99.8
S.Car.	77,008	45,398	77,008	25,935	-	77,008	100.0	33.7	100.0
Penn.	1,075,545	464,530	1,075,545	15,827	4,175	1,055,988	100.0	1.5	98.2
Va.	1,526,452	554,230	1,492,006	35,152	9,717	1,441,710	97.7	2.3	94.4
W.Va.	707,620	262,966	707,045	111,071	14,670	541,849	99.9	15.7	76.6
All States	5,356,697	2,259,310	5,321,676	211,727	58,876	5,072,454	99.3	4.0	94.7

Table 22 - Control Work Needed on State and Private Lands
Southern Appalachian States
(As of November 30, 1951)

State	Total Acreage of Net Control Area	Acreage in Net Control Area in Need of Pre-Maintenance Work		Percentage of Net Control Area in Need of Pre-Maintenance Work	
		First Work	Rework	First Work	Rework
Del.	6,186	-	-	0	0
Ga.	324,452	-	150	0	0.1
Ky.	114,312	-	-	0	0
Md.	163,590	-	11,363	0	6.9
N. Car.	1,361,532	-	2,660	0	0.2
S. Car.	77,008	-	-	0	0
Tenn.	1,075,545	-	19,557	0	1.8
Va.	1,526,452	34,446	50,296	2.3	3.3
W. Va.	707,620	575	165,196	0.1	23.3
All States	5,356,697	35,021	249,222	0.7	4.7

The pre-maintenance work load involves first working on only 35,021 acres of which 34,446 acres are in Virginia and 575 acres in West Virginia. Examination for possible rework is needed on 249,222 acres of which 66.3% is in West Virginia, 20.2% in Virginia, 7.8% in Tennessee and the balance in Georgia, Maryland and North Carolina. All acreage is on maintenance in Delaware, Kentucky, and South Carolina. Examinations are required on that portion of the 5,072,454 acres on maintenance where disturbances may have resulted in regeneration of ribes.

Expenditures for Project BLR-3-1

The tabulation below shows an analysis of expenditures for Project BLR-3-1 by states during the calendar year 1951.

State	Federal	Expenditures By States and Local Cooperators (Direct Aid)	Total	Percentage Total By Federal	Percentage Total By States and Local Cooperators
Maryland	$ 516	$ 996	$ 1,512	34.1	65.9
No. Carolina.....	380	2,207	2,587	14.7	85.3
Tennessee.....	484	2,423	2,907	16.6	83.4
Virginia.....	2,876	12,273	15,149	19.0	81.0
W. Virginia.....	677	3,926	4,603	14.7	85.3
Total So. Appalachian States	$4,933	$21,825	$ 26,758	18.4	81.6

As indicated in the tabulation, the amounts expended by the states and local cooperators greatly exceeded federal W-E expenditures in all states and in the aggregate represented 81.6% of the total compared with federal expenditures of 18.4%.

Table 23 - Total Expenditures and Contributed Services for Work Project BLR-3-1, Calendar Year 1951

South Appalachian States

State	State and Local Cooperative Expenditures and Contributed Services								B.E. & P.Q. (WE-14)	Grand Total
	Cash Expenditures					Value of Contributed Services		Total		
	State Funds	Towns	Counties	Indiv.	Sub-Total	State	Indiv. & Counties			
Md.	$ 996	-	-	-	$ 996	$ 300	-	$ 1,296	$ 516	$ 1,812
No.Car.	2,207	-	-	-	2,207	600	-	2,807	350	3,157
Tenn.	2,423	-	-	-	2,423	60	-	2,483	484	2,967
Va.	11,997	-	-	$ 276	12,273	700	-	12,973	2,876	15,849
W. Va.	3,926	-	-	-	3,926	50	-	3,976	677	4,653
All States	$21,549	-	-	$ 276	$ 21,825	$ 1,710	-	$ 23,535	$ 4,933	$ 28,468

Table 24 - Total Expenditures and Contributed Services for Work Project BLR-3-1, Calendar Year 1951 - Region

	State and Local Cooperative Expenditures and Contributed Services									
	Cash Expenditures					Value of Contributed Services		Total	B.E. & P.Q. (WE-14)	Grand Total
	State Funds	Towns	Counties	Indiv.	Sub-Total	State	Indiv. & Counties			
Northeastern States	$201,778	$ 55,284	$ 21,862	$ 3,164	$282,088	$ 5,135	-	$287,223	$ 83,667	$370,890
So. Appalachian States	21,549	-	-	276	21,825	1,710	-	23,535	4,933	28,468
Region	$223,327	$ 55,284	$ 21,862	$ 3,440	$303,913	$ 6,845	-	$310,758	$ 88,600	$399,358

PART IV

BLISTER RUST CONTROL WORK ON NATIONAL FORESTS

FINANCIAL PROJECT BLR-4

NORTHEASTERN STATES

There are three National Forests in the Northeastern States section of the region, namely, White Mountain in New Hampshire and Maine, Green Mountain in Vermont, and Allegheny in Pennsylvania. The only work performed in 1951 was a small job on the Allegheny National Forest. This involved a first working on 275 acres from which 5,845 wild ribes were removed through the use of 65 man-days of labor.

The present net control area on thethree forests aggregates 9,997 acres of which 3,026 acres are white pine. Initial work has been completed entirely and 68.0% of the control areas have been worked twice.

The acreages on maintenance are as follows: Green Mountain 100%, White Mountain 69.7% and Allegheny only 49.3%. Rework is needed on 3,686 acres representing 36.9% of the acreage on the three forests.

Details of 1951 accomplishments are included in Table 25, on status in Table 26, and on control needs in Table 27.

SOUTHERN APPALACHIAN STATES

1951 Accomplishments in Ribes Eradication

Work on the National Forests in the Southern Appalachian States was performed principally on the George Washington National Forest in Virginia and West Virginia and on the Monongahela in West Virginia. Minor acreages were covered in the Nantahala and Pisgah in North Carolina in Region 8. An aggregate area of 77,875 acres was covered of which 54,445 acres were classed as ribes-free. From the ribes-bearing area of 23,430 acres, 259,444 ribes were destroyed through the use of 4,657 man-days of labor. The 12.5 figure of ribes per acre compares with 6 per acre in 1950. The production rate of 5.0 acres per man day approximated the 5.6 rate of 1950.

Table 25 includes the details of the 1951 accomplishments by Forests.

Status of Control

As of November 30, 1951, there were 1,761,052 acres in the net control area of which 1,010,094 acres represents white pine acreage. First working has been performed on 99.7% of the control area in the National Forests and 95.0% is on maintenance.

First work is needed on only one forest, namely, the George Washington where there is an unworked area of 5,224 acres. Rework is required on an aggregate area of 82,884 acres of which 77.9% is on the George Washington.

Details of the status of control are included in Table 26 and work needed in Table 27.

Table 25 - Summary of Ribes Eradication Work on National Forests During 1951 - Region

Project	First Working			Second Working			Other Working			All Workings			Per Acre Values**		
	Acres	Ribes	Man Days	Acres	Ribes	Man Days	Acres	Ribes	Man Days	Acres	Ribes	Man Days	Ribes	Man Days	Acres Per Man Day
Allegheny	275	5,845	65	-	-	-	-	-	-	275	5,845	65	21.3	.236	4.2
Sub-total Northeastern States	275	5,845	65	-	-	-	-	-	-	275	5,845	65	21.3	.236	4.2
Geo. Washington	57,995*	132,550	1,024	8,500	61,000	1,674	7,085	48,977	1,414	73,581*	242,527	4,112	12.7	.215	4.7
Monongahela	-	-	-	-	-	-	4,172	15,495	521	4,172	15,495	521	3.7	.125	8.0
Nantahala	-	-	-	7	727	4	-	-	-	7	727	4	103.9	.571	1.8
Pisgah	-	60	2	25	167	3	90	468	15	115	695	20	6.0	.174	5.7
Sub-total So. Appalachian States	57,995*	132,610	1,026	8,532	61,894	1,681	11,348	64,940	1,950	77,875*	259,444	4,657	11.1	.199	5.0
Region Total	58,270*	138,455	1,091	8,532	61,894	1,681	11,348	64,940	1,950	78,150*	265,289	4,722	11.2	.199	5.0

* Includes 54,445 acres ribes-free

** Based on ribes-bearing acres only

Table 26 - Status of Ribes Eradication on National Forests - Region

November 30, 1951

National Forest		Total Acreage of Net Control Area	Acreage of White Pine	Acreage Detail Mapped or Surveyed	Net Acreage Worked			Acreage on Maintenance	Percentage of Net Control Area			
					First Work	Second Work	Other Workings		Detail Mapped or Surveyed	Worked Once	Worked Twice	On Maintenance
White Mt.	Maine	2,305	1,000	2,305	2,305	881	120	759	100.0	100.0	38.2	32.9
	N. H.	3,034	980	3,034	3,034	2,984	2,683	2,964	100.0	100.0	98.3	97.7
	Total	5,339	1,980	5,339	5,339	3,865	2,803	3,723	100.0	100.0	72.4	69.7
Green Mt.		573	89	513	573	115	-	573	89.5	100.0	20.1	100.0
Allegheny		4,085	957	4,085	4,085	2,815	821	2,015	100.0	100.0	68.9	49.3
Sub-total Northeastern States		9,997	3,026	9,937	9,997	6,795	3,624	6,311	99.4	100.0	68.0	63.1
Geo. Washington		419,219	191,267		413,995	69,152	37,616	349,454		98.8	16.5	83.4
Jefferson		107,474	55,084		107,474	3,737	856	102,869		100.0	3.5	95.7
Monongahela		89,559	46,854		89,559	11,606	5,395	82,541		100.0	12.9	92.2
Cumberland		32,002	16,980		32,002	65	65	32,002		100.0	0.2	100.0
Pisgah		161,752	92,697		161,752	2,943	1,780	158,535		100.0	1.8	98.0
Nantahala		62,709	42,138		62,709	-	-	62,702		100.0	0	99.9
Cherokee		484,572	250,378		484,572	2,103	41	481,266		100.0	0.4	99.3
Sumter		53,862	18,794		53,862	3,700	-	53,862		100.0	6.9	100.0
Chattahoochee		349,903	295,902		349,903	330	97	349,713		100.0	0.9	99.9
Sub-total So. Appalachian States		1,761,052	1,010,094		1,755,828	93,636	45,850	1,672,944		99.7	5.2	95.0
Region Total		1,771,049	1,013,120		1,765,825	100,431	49,474	1,679,255		99.7	5.7	94.8

Table 27 - Control Work Needed on National Forests - Region
(as of November 30, 1951)

National Forest		Total Acreage of Net Control Area	Acreage in Net Control Area in need of			Percentage of Net Control Area in need of		
			Detail Mapping or Survey	Pre-Maintenance Work		Detail Mapping or Survey	Pre-Maintenance W	
				First Work	Rework		First Work	Rew
White Mt.	Maine	2,305	0	-	1,546	0	0	67.1
	N. H.	3,034	0	-	70	0	0	2.3
	Total	5,339	0	-	1,616	0	0	30.3
Green Mt.		573	60	-	-	10.5	0	0
Allegheny		4,085	0	-	2,070	0	0	50.7
Sub-total No. East. States		9,997	60	-	3,686	0.6	0	36.9
Geo. Washington		419,219		5,224	64,541		1.2	15.4
Jefferson		107,474		-	4,605		0	4.3
Monongahela		89,559		-	7,018		0	7.8
Cumberland		32,002		-	-		0	0
Pisgah		161,752		-	3,217		0	2.0
Nantahala		62,709		-	7		0	0.1
Cherokee		484,572		-	3,306		0	0.7
Sumter		53,862		-	-		0	0
Chattahoochee		349,903		-	190		0	0.1
Sub-total S. A. States		1,761,052		5,224	82,884		0	4.7
Region		1,771,049		5,224	86,570		0.3	4.9

PART V

BLISTER RUST CONTROL ON NATIONAL PARKS

FINANCIAL PROJECT BLR-5

NORTHEASTERN STATES

Control activities in cooperation with the National Park Service in the Northeastern States are restricted to a project at Acadia National Park in Maine. The entire control area comprising 16,872 acres, was classified as on maintenance in 1945. Some maintenance work was performed in 1946 and 1947. The control problem on this park was greatly complicated, however, by the devastating forest fire of October 1947 which burned over nearly 16,000 acres on Mount Desert Island, including 8,600 acres or 51% of the control area in the park.

A 1951 inspection in the burned area showed spotty pine reproduction on portions, together with a mixture of spruce, red pine and sprout hardwoods. On some limited areas it was found that white pine reproduction was established at a rate of between 500 and 1,000 trees per acre, mostly 2-3 year old seedlings. No serious competition was noted between sprout hardwoods or spruce. The absence of seed trees over most of the burned area makes future stocking of white pine questionable. A mixed hardwood and spruce stand will probably replace white pine over much of the burned area. The question at the present time is whether the ultimate acreage of white pine reproduction will justify further control efforts. Definite conclusions must await the opportunity for further inspection and mapping.

SOUTHERN APPALACHIAN STATES

There are three National Park areas involved in the control program in the Southern Appalachian States. These are the Shenandoah National Park in Virginia, the Blue Ridge Parkway in North Carolina and Virginia, and the Great Smoky National Park in No. Carolina and Tennessee. The aggregate control area amounts to 139,064 acres of which 76,758 acres are white pine.

During 1951 control work was performed in the Shenandoah and Blue Ridge Parkway. An aggregate area of 333 acres was covered from which 2,712 ribes were removed through the use of 81 man-days of labor.

As of November 30, 1951 all first work had been completed. Second work had been performed on 5.4% and 92.9% is on maintenance. There will be need for rework on 9,813 acres which represents only 6.3% of the net control area.

Details of 1951 accomplishments are included in Table 28; status of control in Table 29; and further requirements in Table 30.

Table 28 - Summary of Ribes Eradication on National Parks During 1951 - Region*

Project	First Working			Second Working			Other Working			All Workings			Per Acre Values		
	Acres	Ribes	Man Days	Acres	Ribes	Man Days	Acres	Ribes	Man Days	Acres	Ribes	Man Days	Ribes	Man Days	Acres Per Man Day
Blue Ridge Nat'l. Pkwy.	-	333	4	-	10	1	15	329	1	15	672	6	44.8	.333	2.5
Shenandoah	-	-	-	-	-	-	318	2,040	75	318	2,040	75	6.4	.233	4.2
All Nat'l. Parks	-	333	4	-	10	1	333	2,369	76	333	2,712	81	8.1	.243	4.1

* All work on National Parks in 1951 restricted to So. Appalachian States

Table 29 - Status of Ribes Eradication on National Parks - Region

November 30, 1951

ational Park	Total Acreage of Net Control Area	Acreage of White Pine	Acreage Detailed Mapped or Surveyed	Net Acreage Worked			Acreage on Maintenance	Percent of Net Control Area			
				First Work	Second Work	Other Workings		Detailed Mapped or Surveyed	Worked Once	Worked Twice	On Maintenance
cadia	16,872	3,200	0	16,872	11,271	8,207	16,872	0	100.0	66.8	100.0
Sub-total o.East. States	16,872	3,200	0	16,872	11,271	8,207	16,872	0	100.0	66.8	100.0
henandoah	14,270	3,080		14,270	5,012	4,111	12,790		100.0	35.1	89.6
lue Ridge Pkway.	13,890	5,773		13,890	2,087	119	11,606		100.0	15.0	83.6
reat Smoky	110,904	67,905		110,904	413	360	104,855		100.0	0.4	94.5
Sub-total . A. States	139,064	76,758		139,064	7,512	4,590	129,251		100.0	5.4	92.9
Region	155,936	79,958		155,936	18,783	12,797	146,123		100.0	12.0	93.7

Table 30 - Control Work Needed on National Parks - Region
(as of November 30, 1951)

National Park	Total Acreage of Net Control Area	Acreage in Net Control Area in need of			Percentage of Net Control Area in need of		
		Detailed Mapping or Survey	Pre-Maintenance Work		Detailed Mapping or Survey	Pre-Maintenance Work	
			First Work	Rework		First Work	Rework
Acadia	16,872	16,872	-	-	100.0	0	0
Sub-total N.East.States	16,872	16,872	-	-	100.0	0	0
Shenandoah	14,270		-	1,480		0	10.4
Blue Ridge Pkway.	13,890		-	2,284		0	16.4
Great Smoky	110,904		-	6,049		0	5.5
Sub-total S. A. States	139,064		-	9,813		0	7.1
Region	155,936		-	9,813		0	6.3

PART VI

APPENDIX

INDEX TO TABULAR SUMMARIES

Table 31 - Total Bureau, State and Local Expenditures for All Blister Rust Control Activities During Calendar Year 1951 - Region

State	Federal (ALL B.E. & P.Q.)			States and Local Cooperators						Grand Total
				States						
	W.A.-14	W.E.-14	Total	Cash	Contributed Services	Individuals	Towns	Counties	Total	
Maine	$ 19,674	$ 10,625	$ 30,299	$ 8,538	$ 500	$ 743	$ 14,498	-	$ 24,279	54,578
N. H.	31,616	18,037	49,653	11,904	275	403	33,885	-	46,467	96,120
Vt.	17,540*	7,888	25,428	4,508	490	223	6,143	-	11,364	36,792
Mass.	16,652**	5,022	21,674	10,962	-	1,795	-	-	12,757	34,431
R. I.	-	-	-	1,828	160	-	-	-	1,988	1,988
Conn.	3,803	2,277	6,080	9,987	610	-	758	-	11,355	17,435
N. Y.	37,606	29,835	67,441	135,824	2,750	-	-	$ 21,862	160,436	227,877
Penna.	15,531	9,983	25,514	18,227	350	-	-	-	18,577	44,091
Sub Totals	142,422	83,667	226,089	201,778	5,135	3,164	55,284	21,862	287,223	513,312
Md.	843	516	1,359	996	300	-	-	-	1,296	2,655
No.Car.	5,513	380	5,893	2,207	600	-	-	-	2,807	8,700
Penn.	2,397	484	2,881	2,423	60	-	-	-	2,483	5,364
Va.	23,613	2,876	26,489	11,997	700	276	-	-	12,973	39,462
W. Va.	15,104	677	15,781	3,926	50	-	-	-	3,976	19,757
Sub Totals	47,470	4,933	52,403	21,549	1,710	276	-	-	23,535	75,938
Region	$189,892***	$ 88,600	$278,492	$223,327	$ 6,845	$ 3,440	$ 55,284	$ 21,862	$310,758	589,250

* Includes $1,254 for wages L/A labor.

** Includes $1,315 for wages L/A labor.

*** Does not include $22,165 W-A money expended for the Regional Office.

Table 32 - Informational and Service Activities of District Blister Rust Control Leaders During Period 1922-1951, Inclusive - Northeastern States

Informational Activities

State	Meetings Addressed		Radio Talks*	Items Published	Displays Placed
	Number	Attendance			
Maine	1,486	42,048	-	714	1,177
N. H.	4,281	244,274	-	4,776	2,312
Vt.	1,258	45,725	-	768	1,022
Mass.	1,138	61,645	9	2,202	883
R. I.	284	20,698	-	408	143
Conn.	178	6,395	1	643	208
N. Y.	2,455	196,828	4	3,120	893
Penna.	57	4,843	2	73	122
All States	11,137	622,456	16	12,709	6,760

* No record kept prior to 1949

Service Activities

State	Initial Interviews	Follow-up Calls	Persons Instructed in Field
Maine	40,493	15,425	25,291
N. H.	45,085	47,036	25,842
Vt.	17,454	15,057	10,694
Mass.	41,920	13,836	12,820
R. I.	4,231	3,373	784
Conn.	6,729	4,242	2,261
N. Y.	43,231	33,159	30,875
Penna.	3,302	670	4,239
All States	202,445	132,798	112,806

Table 33 - Local Cooperation on Blister Rust Control Work, 1918 to 1951, Inclusive
Northeastern States

Individual Cooperation

State	No. Cooperators		Amount Spent By
	Ribes Erad.	Canker Elimin.	Individual Cooperators
Maine	11,106	25	$ 86,097
N. H.	695	-	49,781
Vt.	2,365	12	77,090
Mass.	21,947	-	117,527
R. I.	8	-	581
Conn.	523	-	11,934
N. Y.	5,987	2	177,122
Penna.	303	-	2,273
All States	42,934	39	$522,405

Town Cooperation

State	No. Town		Amount Town Money
	Appropriations	Contributions	Expended
Maine	1,233	20	$ 213,533
N. H.	2,084	20	646,960
Vt.	267	64	73,553
Mass.	4	65	26,297
Conn.	154	51	38,863
N. Y.	29	3	9,423
All States	3,771	223	1,008,629

County Cooperation

State	No. County Appropriations or Allotments	Amount Spent by Counties
N. H.	6	$ 1,724
N. Y.	169	196,076
All States	175	$197,800

Table 34 - Control Area Examination and Mapping Work, 1933-1951, Inclusive
Northeastern States

State	Total Acreage Reported Mapped*	Acreage Examined But Not Mapped*	Miles Boundary Lines Painted**	Total Man Days
Maine	2,606,444	5,177,390	1,805	38,786
N. H.	2,326,616	1,333,362	-	48,214
Vt.	1,720,290	4,610,969	828	24,652
Mass.	1,418,827	1,814,768	1,290	22,195
R. I.	323,044	178,873	-	3,337
Conn.	1,067,290	3,369,046	3,202	27,623
N. Y.	5,306,083	7,309,119	2,403	63,226
Penna.	1,177,314	951,812	7,369	46,735
All States	15,945,908	24,745,339	16,900	274,768

*Total Acreage Reported Mapped includes a large amount of remapping especially in Vermont, Connecticut, and New York. Also includes areas which were mapped and subsequently discontinued from the control area. Acreage Examined But Not Mapped was largely outside control area and data include two examinations in many instances.

**No record kept of this item after 1945.

Table 35 - Nursery Sanitation Work, 1930-1951, Inclusive - Region Totals

State	Nurseries Initially Protected	Acres Worked	Ribes Destroyed	Man Days	Nurseries Still Active
Maine	7	1,735	114,357	463	2
N. H.	3	3,055	7,826	285	2
Vt.	1	2,563	4,961	412	1
Mass.	19	8,153	50,025	1,270	6
R. I.	6	19,936	5,695	444	-
Conn.	21	73,380	35,880	2,939	3
N. Y.	9	133,263	169,629	6,764	5
N. J.	2	1,845	2,879	128	1
Penna.	14	35,673	103,586	4,529	8
Sub-total Northeastern	82	279,603	494,838	17,234	28
Del.	5	700	93	-	-
Ga.	1	25	8	1	-
Ky.	1	200	24	-	1
Md.	14	4,740	3,058	402	1
N. Car.	20	6,429	2,423	242	1
Tenn.	3	1,202	14	13	1
Va.	10	2,020	136	16	-
W. Va.	2	813	31,987	818	2
Sub-total So. Appl'n.	56	16,129	37,743	1,492	6
Region	138	295,732	532,581	18,726	34

Table 36 - Status of Nursery Sanitation Work, December 31, 1951

Northeastern States

State	Nurseries Where Protection Established and Being Maintained				No. Nurseries Protected During 1951	No. Additional Nurseries Which Established Zones But Now Abandoned
	Number				Acreage of Control Areas	
	Federal	State	Private	Total		
Maine	-	1	1	2	473	-	5
N. H.	-	1	1	2	749	-	1
Vt.	-	1	-	1	333	-	-
Mass.	-	4	2	6	1,485	-	14
R. I.	-	-	-	-	-	-	6
Conn.	-	1	2	3	1,036	1	18
N. Y.	1	4	2	5	4,366	3	3
N. J.	-	1	-	1	600	-	1
Penna.	-	5	3	8	3,921	1	6
All States	1	18	9	28	12,963	5	54

Table 37 - List of Nurseries Maintaining Sanitation Zones in Northeastern Region December 31, 1951

	Acreage of Sanitation Zone
Maine	
Western Maine Nursery - Fryeburg, Maine	311
State Nursery - Orono, Maine	162
	473
New Hampshire	
Keene Forestry Associates - Keene, N. H.	250
State Nursery - Boscawen, N. H.	499
	749
Vermont	
State Nursery - Essex Junction, Vt.	333
Massachusetts	
Department of Conservation Nursery - Amherst, Mass.	225
Department of Conservation Nursery - Bridgewater, Mass.	100
Department of Conservation Nursery - Clinton, Mass.	150
Department of Conservation Nursery - Erving, Mass.	50
Kelsey Highlands Nursery - Boxford, Mass.	900
Weston Nursery - Weston, Mass.	60
	1,485

Table 37 - List of Nurseries Maintaining Sanitation Zones in Northeastern Region December 31, 1951 (Continued)

	Acreage of Sanitation Zone
Connecticut	
Northeastern Forestry Company - Cheshire, Conn.	356
State Nursery - Barkhamstead, Conn.	492
Great Pond Nursery - Simsbury, Conn.	188
	1,036
New York	
State Nursery - Saratoga Springs, N. Y. (old portion	705
(new portion	1,605
State Nursery - Lowville, N. Y.	1,150
N. Y. State College of Forestry Nursery - Syracuse, N. Y.	230
State Nursery (Division of Fish and Game) - Painted Post, N. Y.	206
Soil Conservation Service Nursery - Big Flats, N. Y.	470
	4,366
New Jersey	
State Nursery - Washington Crossing, N. J.	600
Pennsylvania	
Clearfield State Nursery - Clearfield, Penna.	370
Greenwood State Nursery - Petersburg, Penna.	411
Mt. Alto State Nursery - Mt. Alto, Penna.	366
Rockview State Nursery - Pleasant Gap, Penna.	354
Howard State Nursery - Mt. Eagle, Penna.	215
Andorra Nursery - Chester Hill, Penna.	1,065
Fairview Nursery - Fairview, Penna.	559
Doyle Nursery - Seven Stars, Penna.	581
	3,921
All States	
26 Nurseries	12,963

Table 38 - Blister Rust Canker Elimination Work, 1932-1951, Inclusive
Northeastern States

State	Ownership Class	Total Number Pines Examined	Number Fatally Infected Pines Cut Down	No. Additional Infected Pines From Which Cankers Removed	Total Number Cankers	Total Man Days
Maine	State & Private	95,207	7,950	12,091	19,901	713
	Acadia Nat. Park	61,572	3,376	9,924	32,336	2,476
	Total	156,779	11,326	22,015	52,237	3,189
N. H.	All State & Private	29,081	5,766	638	711	219
Vt.	"	272,593	40,924	21,389	25,264	3,047
Mass.	"	4,778,017	32,416	16,699	22,451	8,762
N. Y.	"	2,002,712	164,132	204,753	277,054	14,858
Penna.	"	919,698	32,670	130,020	569,029	7,312
All States	State & Private	8,097,308	283,858	385,590	914,410	34,911
	National Park	61,572	3,376	9,924	32,336	2,476
	Total	8,158,880	287,234	395,514	946,746	37,387

Table 39 - State Compensation Paid For Cultivated Ribes Destroyed, 1918 to 1951, Inclusive
Northeastern States

State	Total No. Cult. Ribes Destroyed	No. Bushes Paid For	% Bushes Paid For	No. Persons Paid Compensation	Amount Paid in Reimbursement	Average Amount Paid Per Bush
Maine	162,202	0	0	0	0	0
N. H.	163,717	2,008	1.2	63	$550.60	$.274
Vt.	18,879	1,646	8.7	133	792.91	.482
Mass.	335,427	42,098	12.6	674	15,029.75	.357
R. I.	41,943	1,410	3.4	58	509.79	.362
Conn.	90,700	175	0.2	16	103.50	.591
N. Y.	193,614	16,340	8.4	1,152	5,590.99	.342
N. J.	1,842	0	0	0	0	0
Penna.	63,432	517	0.8	71	167.75	.342
All States	1,071,756	64,194	6.0	2,167	$22,745.29	$.354

No federal money has been spent for ribes compensation.
No ribes compensation has ever been paid in the Southern Appalachian States.

Table 40 - Ribes Eradication Work, 1946-1951, Inclusive - Northeastern States

By States

State	Type of Work	Gross Acreage Reported Worked	No. Ribes Destroyed (Wild & Cult.)	Total Man Days	Per Acre		Acres Worked Per Man Day
					Ribes	Man Days	
Maine	First	2,579,991	47,411,815	263,526	18.4	.102	9.8
	Second	1,427,111	15,197,931	162,579	10.6	.114	8.8
	Other	305,286	535,933	6,923	1.8	.023	44.1
	Total	4,312,388	63,145,679	433,028	14.6	.100	10.0
N. H.	First	3,360,651	58,360,973	313,657	17.4	.093	10.7
	Second	1,507,195	14,432,992	140,462	9.6	.093	10.7
	Other	210,652	671,689	12,619	4.1	.060	16.7
	Total	5,078,498	73,665,654	466,738	14.5	.092	10.9
Vt.	First	707,116	12,956,707	132,870	18.3	.187	5.3
	Second	299,297	3,372,357	50,976	11.3	.170	5.9
	Other	43,843	170,355	3,477	3.9	.079	12.6
	Total	1,050,256	16,499,419	187,323	15.7	.178	5.6
Mass.	First	2,147,469	17,046,022	133,251	7.9	.062	16.1
	Second	1,330,483	6,286,680	101,419	4.7	.076	13.1
	Other	167,125	321,712	6,465	19.2	.039	25.9
	Total	3,645,077	23,654,414	241,135	6.5	.066	15.1
R. I.	First	330,050	269,502	21,251	0.8	.064	15.5
	Second	315,111	377,557	53,704	1.2	.170	5.9
	Other	101,844	20,042	3,090	0.2	.030	33.0
	Total	747,005	667,101	78,045	0.9	.104	9.6
Conn.	First	493,842	2,496,108	39,773	5.6	.089	11.2
	Second	446,647	4,888,040	92,929	10.9	.208	4.8
	Other	404,659	195,033	8,749	1.2	.022	46.3
	Total	1,345,148	7,879,181	141,451	6.1	.109	9.2
N. Y.	First	3,132,816	68,138,612	734,150	22.4	.242	4.1
	Second	1,916,613	14,763,570	235,566	7.7	.123	8.1
	Other	1,280,304	2,944,975	50,996	2.3	.040	25.1
	Total	6,329,733	85,847,157	1,020,712	13.6	.164	6.1
N. J.	First	16,742	49,493	1,324	3.0	.079	12.6
	Second	1,417	16,971	392	12.0	.277	3.6
	Total	18,159	66,464	1,716	3.7	.094	10.6
Penna.	First	762,313	34,070,030	334,326	44.7	.439	2.3
	Second	450,848	6,471,072	167,026	14.4	.370	2.7
	Other	144,206	398,930	6,671	2.8	.046	21.6
	Total	1,357,367	40,940,032	508,023	30.2	.374	2.7
All N.E. States	First	13,530,990 *	240,799,262	1,974,128	18.0	.147	6.8
	Second	7,694,722	65,807,170	1,005,053	8.6	.131	7.7
	Other	2,657,919	5,728,669	98,990	2.2	.037	26.9
	Total	23,883,631 *	312,335,101	3,078,171	13.2	.130	7.7

* Includes ribes-free area of 49,549 acres in Connecticut and 95,976 acres in New York or a total of 145,525 acres.

Table 41 - Ribes Eradication Work, 1918-1951, Inclusive - By States

Southern Appalachian States* and Region

State	Type of Work	Gross Acreage Reported Worked	No. Ribes Destroyed (Wild & Cultivated)	Total Man Days
Delaware	First	6,186	6,889	268
	Second	-	-	-
	Other	-	-	-
	Total	6,186	6,889	268
Georgia	First	677,227	2,736,579	11,094
	Second	2,622	252,676	1,128
	Other	653	8,063	433
	Total	680,502	2,997,318	12,655
Kentucky	First	160,886	4,111	1,492
	Second	65	931	19
	Other	65	36	8
	Total	161,016	5,078	1,519
Maryland	First	176,488	3,195,394	12,957
	Second	39,628	424,959	4,669
	Other	27,824	511,585	5,450
	Total	243,940	4,131,938	23,076
North Carolina	First	1,722,025	2,442,953	44,444
	Second	9,131	334,704	11,307
	Other	4,348	38,786	1,339
	Total	1,735,504	2,816,443	57,090
South Carolina	First	130,870	7,487	2,227
	Second	-	-	-
	Other	-	-	-
	Total	130,870	7,487	2,227
Tennessee	First	1,698,378	5,908,686	42,134
	Second	83,725	487,065	6,494
	Other	4,216	35,961	871
	Total	1,786,319	6,431,712	49,499
Virginia	First	2,012,153	8,728,561	88,053
	Second	107,060	2,448,543	37,094
	Other	47,085	1,307,164	16,706
	Total	2,166,298	12,484,268	141,853
West Virginia	First	857,984	6,085,246	47,241
	Second	132,352	1,486,620	23,045
	Other	25,885	158,919	3,973
	Total	1,016,221	7,730,785	74,259
All So.Appln. States	First	7,442,197	29,115,906	249,910
	Second	374,583	5,435,498	83,756
	Other	110,076	2,060,514	28,780
	Total	7,926,856	36,611,918	362,446
All Northeastern States	First	13,530,990	240,799,262	1,974,128
	Second	7,694,722	65,807,170	1,005,053
	Other	2,657,919	5,758,639	98,990
	Total	23,883,631	312,365,101	3,078,171
Region	First	20,973,187**	269,915,168	2,224,038
	Second	8,069,305	71,242,668	1,038,809
	Other	2,767,995	7,819,183	127,770
	Total	31,810,487**	348,977,019	3,440,617

*Data for the Southern Appalachian States covers the period from 1933-1951, Incl.

**Includes ribes-free area of 146,525 acres in Northeastern States and 6,761,951 acres in the Southern Appalachian States, or a Region total of 6,907,476 acres.

Table 42 - Ribes Eradication Work, 1918-1951, Inclusive - Northeastern States

(By Agency)

Agency	Type of Work	Gross Acreage Reported Worked	No. Ribes Destroyed (Wild & Cult.)	Total Man Days	Per Acre		Acr Work pe Man D
					Ribes	Man Days	
U. S. Forest Service							
Bureau and State	First	13,494,563	238,259,654	1,956,647	17.8	.146	6.8
	Second	7,665,679	65,324,292	997,994	8.5	.130	7.7
	Other	2,643,081	5,724,318	97,798	2.2	.037	27.0
	Total	23,803,323	309,308,264	3,052,439	13.1	.129	7.8
Nat'l.Park Service	First	20,716	893,940	11,227	43.2	.542	1.8
Acadia National Park	Second	18,159	59,356	4,450	3.3	.245	4.1
	Other	8,207	6,100	656	0.7	.080	12.5
	Total	47,082	959,396	16,333	20.4	.347	2.9
White Mountain	First	9,529	617,694	2,957	65.8	.310	3.2
	Second	7,843	323,774	1,854	41.3	.236	4.2
	Other	5,317	11,238	253	2.1	.048	21.0
	Total	22,689	1,152,706	5,064	50.8	.223	4.5
Green Mountain	First	458	3,298	31	7.2	.068	14.8
	Second	115	252	12	2.2	.104	9.6
	Total	573	3,550	43	6.2	.075	13.3
Allegheny	First	5,724	824,676	3,266	144.1	.571	1.8
	Second	2,926	99,496	743	34.0	.254	3.9
	Other	1,314	17,013	283	12.9	.215	4.6
	Total	9,964	941,185	4,292	94.5	.431	2.3
Total	First	15,711	1,645,668	6,254	104.7	.398	2.5
	Second	10,884	423,522	2,609	38.9	.240	4.2
	Other	6,631	28,251	536	4.3	.081	12.4
	Total	33,226	2,097,441	9,399	63.1	.283	3.5
All Agencies	First	13,530,990 *	240,799,262	1,974,128	18.0	.147	6.8
	Second	7,694,722	65,807,170	1,005,053	8.6	.131	7.7
	Other	2,657,919	5,758,669	98,990	2.2	.037	26.9
Northeastern States	Total	23,883,631 *	312,365,101	3,078,171	13.2	.130	7.7

* Includes ribes-free area of 49,549 acres in Connecticut and 95,976 acres in New York or a total of 145,525 acres.

Table 43 - Ribes Eradication Work, 1918-1951, Inclusive
Southern Appalachian States* and Region
(By Agencies)

	Agency	Type of Work	Gross Acreage Worked	No. Ribes Destroyed (Wild & Cultivated)	Total Man Days
	Bureau and State	First	5,522,646	23,964,073	201,180
		Second	257,698	3,546,096	56,851
		Other	53,824	1,137,501	10,960
		Total	5,834,168	28,647,670	268,991
National Park Service	Shenandoah National Park	First	19,392	1,254,387	11,861
		Second	10,867	367,049	4,786
		Other	6,693	272,857	5,545
		Total	36,952	1,894,293	22,192
	Blue Ridge Parkway	First	10,719	18,642	473
		Second	856	3,647	193
		Other	119	1,382	23
		Total	11,694	23,671	689
	Great Smoky Mountain Natl. Park	First	28,285	95,254	1,421
		Second	383	2,747	122
		Other	355	2,559	190
		Total	29,023	100,560	1,733
	Subtotals Natl. Parks	First	58,396	1,368,283	13,755
		Second	12,106	373,443	5,101
		Other	7,167	276,798	5,758
		Total	77,669	2,018,524	24,614
U. S. Forest Service	George Washington	First	596,632	1,411,125	16,966
		Second	63,758	1,254,161	16,409
		Other	37,609	531,163	10,537
		Total	697,999	3,196,449	43,912
	Jefferson	First	302,262	128,343	337
		Second	2,516	131,145	1,388
		Other	640	68,213	186
		Total	305,418	327,701	1,831
	Monongahela	First	29,090	225,331	2,240
		Second	13,671	87,150	2,988
		Other	8,597	34,452	1,017
		Total	51,358	346,933	6,245
	Cumberland	First	38,730	19	328
		Second	-	-	-
		Other	65	36	8
		Total	38,795	49	336
	Pisgah	First	50,937	52,147	1,016
		Second	444	7,253	159
		Other	1,578	4,891	166
		Total	52,959	64,291	1,341
	Nantahala	First	20,434	-	45
		Second	7	727	4
		Other	-	-	-
		Total	20,441	727	49
	Cherokee	First	541,393	1,966,590	11,139
		Second	24,089	24,033	529
		Other	499	6,514	145
		Total	565,981	1,997,137	11,811
	Sumter	First	48,561	-	382
		Second	-	-	-
		Other	-	-	-
		Total	48,561	-	382
	Chattahoochee	First	233,116	1	2,523
		Second	294	11,490	408
		Other	97	946	3
		Total	233,507	12,437	2,934
	Subtotals Natl. Forests	First	1,861,155	3,783,550	34,975
		Second	104,779	1,515,959	21,804
		Other	49,085	646,215	12,062
		Total	2,015,019	5,945,724	68,841
All Agencies Se. Appalachian States		First	7,442,197	29,115,906	247,910
		Second	374,583	5,435,498	83,756
		Other	110,076	2,060,514	28,780
		Total	7,926,856	36,611,918	362,446
All Agencies Northeastern States		First	13,530,990	240,729,262	1,274,128
		Second	7,654,722	65,807,170	1,005,053
		Other	2,657,919	5,758,669	98,990
		Total	23,883,631	312,365,101	3,078,171
Region		First	20,973,187**	269,915,168	2,224,038
		Second	8,059,305	71,242,668	1,088,809
		Other	2,767,995	7,819,183	127,770
		Total	31,810,487**	348,977,019	3,440,617

*Data for the Southern Appalachian States covers the period from 1933-1951, incl.

**Includes ribes-free area of 145,525 acres in Northeastern States and 6,761,951 acres in the Southern Appalachian States, or a Region total of 6,907,476 acres.

Table 44 - Accumulative Ribes-Free Acreage - Region

(November 30, 1951)

	State & Private	Forest Service	Park Service	Total
Conn.	49,549	-	-	49,549
New York	95,976	-	-	95,976
Total N.East. States	145,525	-	-	145,525
Del.	6,186	-	-	6,186
Georgia	437,536	233,115	-	670,651
Ky.	122,061	38,720	-	160,781
Md.	139,808	-	-	139,808
No. Car.	1,604,622	70,086	29,141	1,703,849
So. Car.	82,309	48,561	-	130,870
Tenn.	1,119,249	538,158	6,319	1,663,726
Va.	981,505	713,605	5,490	1,700,600
W. Va.	552,538	32,942	-	585,480
Total So. Appalachian States	5,045,814	1,675,187	40,950	6,761,951
Region	5,191,339	1,675,187	40,950	6,907,476

Table 45 - Ribes Eradication Work on Maintenance Areas, 1946-1951, Inclusive

Northeastern States

(No separate record kept of such work prior to 1946)

State	Land Ownership Class	Acreage Worked	No. Ribes Destroyed		Total Man Days	Per Acre		Acres Worked Per Man Day
			Wild & Cult.	Cult. Only		Ribes	Man Days	
Maine	State & Private	18,942	20,890	10	340	1.1	.018	55.7
	Acadia Nat. Park	8,829	1,162	-	247	0.1	.028	35.7
	Total	27,771	22,052	10	587	0.8	.021	47.3
N. H.	State & Private	26,026	49,871	224	500	1.9	.019	52.0
	White Mt. Nat. Forest	300	-	-	4	-	.013	75.0
	Total	26,326	49,871	224	504	1.9	.019	52.2
Vt.	All State & Private	3,228	9,457	-	106	2.9	.033	30.5
Mass.	"	1,741	3,737	-	60	2.1	.034	29.0
R. I.	"	87,035	13,653	166	1,500	0.2	.017	58.0
Conn.	"	325,215	391,675	-	5,276	1.2	.016	61.6
N. Y.	"	293,591	436,226	278	8,301	1.5	.028	35.4
Penna.	"	55,337	47,487	120	1,275	0.9	.023	43.4
All States	State & Private	811,115	972,996	798	17,358	1.2	.021	46.7
	National Forest	300	-	-	4	-	.013	75.0
	National Park	8,829	1,162	-	247	0.1	.028	35.7
	Total	820,244	974,158	798	17,609	1.2	.021	46.6

Note: Maintenance Workings are not kept separately in the Southern Appalachian States.

TABLE 46 - STATUS OF BLISTER RUST CONTROL WORK IN PRESENT NET CONTROL AREA IN NORTHEASTERN REGION BY STATES AND DISTRICTS

(November 30, 1951)

State	District	Total Acreage	Acreage of White Pine	Acreage Detail Mapped	Net Acreage Worked				Acreage in Control Area			Percentage of Control Area							
					Pre-Maintenance Work			Maintenance Work	Now on Maintenance Basis	In Need of Pre-Maintenance Work		Detail Mapped	Worked				On Maintenance	In Need of Pre-Maintenance Work	
													Pre-Maintenance			Maintenance			
					First	Second	Other			First Work	Rework		First	Second	Other			First Work	Rework
Maine	Bradbury	777,369	233,534	741,354	671,437	321,452	69,256	21,133	350,344	105,932	321,093	95.4	86.4	41.4	8.9	2.7	45.1	13.6	41.3
	Calderara	783,678	305,922	731,252	744,773	484,154	80,884	1,073	284,901	38,905	459,872	93.3	95.0	61.8	10.3	.1	36.4	5.0	58.6
	Pike	839,730	397,241	675,598	839,730	614,714	133,062	6,041	501,709	-	338,021	80.5	100.0	73.2	15.8	.7	59.7	0	40.3
	Totals for State	2,400,777	936,697	2,148,204	2,255,940	1,420,320	283,202	28,247	1,136,954	144,837	1,118,986	89.5	94.0	59.2	11.8	1.2	47.4	6.0	46.6
N. H.	Boomer	407,376	167,466	397,087	398,956	197,090	12,979	1,650	149,033	8,420	249,923	97.5	97.9	48.4	3.2	.4	36.6	2.1	61.3
	Codman	283,161	137,964	241,049	280,759	190,274	46,954	11,892	160,177	2,402	120,582	85.1	99.2	67.2	16.6	4.2	56.6	.8	42.6
	Conner	720,042	335,110	322,698	711,154	434,537	51,155	7,263	309,127	8,888	402,027	44.8	98.8	60.3	7.1	1.0	42.9	1.2	55.9
	Curtis	614,455	291,032	245,755	605,605	233,541	14,649	3,818	201,823	8,850	403,782	40.0	98.6	38.0	2.4	.6	32.8	1.4	65.8
	Newman	230,376	117,068	142,088	230,376	125,813	34,770	-	66,271	-	154,105	61.7	100.0	54.6	15.1	0	28.8	0	71.2
	Richardson	495,036	194,875	365,412	465,541	206,869	10,711	2,133	150,717	29,495	314,824	73.8	94.0	41.8	2.2	.4	30.4	6.0	63.6
	Totals for State	2,750,446	1,243,515	1,714,089	2,692,391	1,388,124	171,218	26,756	1,037,148	58,055	1,655,243	62.3	97.9	50.5	6.2	1.0	37.7	2.1	60.2
Vt.	Mulholland	224,015	46,188	223,956	154,065	48,603	8,138	-	44,481	69,951	109,584	99.9	68.8	21.7	3.6	0	19.9	31.2	48.9
	Palmer	189,093	45,579	188,413	153,656	47,646	5,261	28	124,375	35,437	29,281	99.6	81.3	25.2	2.8	0	65.8	18.7	15.5
	Rose	315,992	76,586	309,693	288,130	115,362	26,056	3,200	238,426	27,862	49,704	98.0	91.2	36.5	8.2	1.0	75.5	8.8	15.7
	Totals for State	729,101	168,353	722,062	595,851	211,611	39,455	3,228	407,282	133,250	188,569	99.0	81.7	29.0	5.4	.4	55.9	13.3	25.8
Mass.	Brockway	518,798	237,904	492,071	494,595	343,650	20,816	416	349,849	24,203	144,746	94.8	95.3	66.2	4.0	.1	67.4	4.7	27.9
	Doore	433,365	133,734	347,309	433,219	365,507	111,428	1,350	279,870	146	153,349	80.1	99.9	84.3	25.7	.3	64.6	.1	35.3
	Eastern Mass.	600,095	222,322	261,443	598,912	463,933	22,192	-	590,228	1,183	8,684	43.6	99.8	77.3	3.7	0	98.4	.2	1.4
	Totals for State	1,552,258	593,960	1,100,823	1,526,726	1,173,090	154,436	1,766	1,219,947	25,532	306,779	70.9	98.4	75.6	9.9	.1	78.6	1.6	19.8
R. I.	Schreier	142,460	61,329	130,017	142,460	136,072	34,068	78,426	142,460	-	-	91.3	100.0	95.5	23.9	55.1	100.0	0	0
Conn.	Miller	270,133	44,163	270,133	270,133	156,305	56,832	187,319	270,133	-	-	100.0	100.0	57.9	21.0	69.3	100.0	0	0
	Schreier	195,357	46,788	195,357	195,357	149,553	72,811	136,471	195,357	-	-	100.0	100.0	76.6	37.3	79.0	100.0	0	0
	Totals for State	465,490	90,951	465,490	465,490	305,858	129,643	323,790	465,490	-	-	100.0	100.0	65.7	27.9	69.6	100.0	0	0
N. Y.	Barber	492,618	136,040	470,628	461,916	381,628	197,312	92,909	213,141	30,702	248,775	95.5	93.8	77.5	40.1	18.9	43.3	6.2	50.5
	Charlton	184,640	49,893	184,640	184,490	145,115	73,000	14,195	115,225	150	69,265	100.0	99.9	78.6	39.5	7.7	62.4	.1	37.5
	Harpp	639,753	297,840	621,477	636,858	587,962	371,198	177,119	416,770	2,895	220,088	97.1	99.5	91.9	58.0	27.7	65.1	.5	34.4
	Hick	215,283	45,243	209,818	207,108	147,474	58,906	20,660	100,261	8,175	106,847	97.5	96.2	68.5	27.4	10.9	46.6	3.8	49.6
	Holcomb	235,010	69,447	208,390	230,630	184,465	106,920	22,645	91,495	4,380	139,135	88.7	98.1	78.5	45.5	9.6	38.9	1.9	59.2
	Sievers	282,293	70,047	236,300	280,458	124,218	15,269	1,820	158,403	1,835	122,055	83.7	99.3	44.0	5.4	.6	56.1	.7	43.2
	Woolschlager	228,993	71,843	142,922	228,993	139,750	46,432	2,915	90,505	-	138,488	62.4	100.0	61.0	20.3	1.3	39.5	0	60.5
	Western N. Y.	152,077	26,713	14,075	142,220	67,498	3,214	10,611	66,186	9,857	76,034	9.3	93.5	44.4	2.1	7.0	43.5	6.5	50.0
	Totals for State	2,430,667	767,066	2,088,250	2,372,673	1,778,110	872,251	342,874	1,251,986	57,994	1,120,687	85.9	97.6	73.2	35.9	14.1	51.5	2.4	46.1
N. J.	Totals for State	16,742	3,771	0	16,742	1,417	-	-	16,742	-	-	0	100.0	8.5	0	0	100.0	0	0
Penna.	DeBerti	179,397	32,157	174,652	166,718	91,248	12,876	4,508	133,113	12,679	33,605	97.4	92.9	50.9	7.2	2.5	74.2	7.1	18.7
	Fatzinger	149,071	41,370	142,411	141,603	113,449	36,330	12,840	108,024	7,468	33,579	95.5	95.0	75.1	24.4	8.6	72.5	5.0	22.5
	Lilley	193,680	38,455	193,480	191,222	111,926	20,520	33,769	150,062	2,458	41,160	99.9	98.7	57.8	10.6	17.4	77.5	1.3	21.2
	Totals for State	522,148	111,982	510,543	499,543	316,623	69,726	51,117	391,199	22,605	108,344	97.8	95.7	60.6	13.4	9.8	74.9	4.3	20.8
Sub-Total	N. E. States	11,010,089	3,977,624	8,879,478	10,567,816	6,731,225	1,753,999	856,204	6,069,208	442,273	4,498,608	80.6	96.0	61.1	15.9	7.8	55.1	4.0	40.9

TABLE 46 (Continued) - STATUS OF BLISTER RUST CONTROL WORK IN PRESENT NET CONTROL AREA IN NORTHEASTERN REGION BY STATES AND DISTRICTS

(November 30, 1951)

State	District	Total Acreage	Acreage of White Pine	Acreage Detail Mapped	Net Acreage Worked				Acreage in Control Area			Percentage of Control Area							
					Pre-Maintenance Work			Maintenance Work	Now on Maintenance Basis	In Need of Pre-Maintenance Work		Detail Mapped	Worked				On Maintenance	In Need of Pre-Maintenance Work	
					First	Second	Other			First Work	Rework		Pre-Maintenance			Maintenance		First Work	Rework
													First	Second	Other				
Del.	Totals for State	6,186	242	6,186	6,186	-	-	-	6,186	-	-	100.0	100.0	0	0	0	100.0	0	0
Georgia	" " "	674,355	544,478	674,355	674,355	1,008	538	-	674,015	-	340	100.0	100.0	.1	.1	0	99.9	0	.1
Ky.	" " "	146,314	48,179	146,314	146,314	65	65	-	146,314	-	-	100.0	100.0	.1	.1	0	100.0	0	0
Md.	" " "	163,590	70,550	163,590	163,590	16,433	27,378	-	152,227	-	11,363	100.0	100.0	10.0	16.7	0	93.1	0	6.9
N.Car.	" " "	1,625,154	733,725	1,625,154	1,625,154	11,218	4,754	-	1,611,973	-	13,181	100.0	100.0	.7	.3	0	99.2	0	.8
S.Car.	" " "	130,870	64,192	130,870	130,870	29,635	-	-	130,870	-	-	100.0	100.0	22.6	0	0	100.0	0	0
Tenn.	" " "	1,643,614	770,707	1,643,614	1,643,614	17,930	4,216	-	1,620,751	-	22,863	100.0	100.0	1.2	.3	0	98.6	0	1.4
Va.	" " "	2,017,253	773,512	2,017,253	1,977,583	104,234	46,480	-	1,860,888	39,670	116,695	100.0	98.0	5.2	2.3	0	92.2	2.0	5.8
W.Va.	" " "	849,922	340,599	849,922	849,347	132,352	25,885	-	671,870	575	177,477	100.0	99.9	15.6	3.0	0	79.1	.1	20.8
Sub-Total	S. A. States	7,257,258	3,346,184	7,257,258	7,217,013	312,875	109,316	-	6,875,094	40,245	341,919	100.0	99.4	4.3	1.5	0	94.7	.6	4.7
GRAND TOTAL	N. E. REGION	18,267,347	7,323,808	16,136,736	17,784,829	7,044,100	1,863,315	856,204	12,944,302	482,518	4,840,527	88.3	97.4	38.6	10.2	4.7	70.9	2.6	26.5

TABLE 47 - STATUS OF BLISTER RUST CONTROL, BY STATES AND LAND OWNERSHIP CLASSES, IN THE NET CONTROL AREA OF THE NORTHEASTERN REGION - NOVEMBER 30, 1951

State	Land Ownership	Total Acreage	Acreage of White Pine	Acreage Detail Mapped	Net Acreage Worked				Acreage in Control Area			Percentage of Control Area							
					Pre-Maintenance Work			Maintenance Work	Now on Maintenance	In Need of Pre-Maintenance Work		Detail Mapped	Worked				On Maintenance	In Need of Pre-Maintenance Work	
					First	Second	Other			First Work	Rework		Pre-Maintenance			Maintenance		First Work	Rework
							State and Private						First	Second	Other				
Maine	State and Private	2,381,600	932,497	2,145,899	2,236,763	1,408,168	278,103	25,019	1,119,323	144,837	1,117,440	90.1	93.9	59.1	11.7	1.1	47.0	6.1	46.9
N. H.	"	2,747,412	1,242,535	1,711,055	2,689,357	1,385,140	168,835	26,456	1,034,184	58,055	1,655,173	62.3	97.9	50.4	6.1	1.0	37.6	2.1	60.3
Vt.	"	728,528	168,264	721,549	595,278	211,496	39,455	3,228	406,709	133,250	188,569	99.0	81.7	29.0	5.4	.4	55.9	18.3	25.8
Mass.	"	1,552,258	593,960	1,100,823	1,526,726	1,173,090	154,436	1,766	1,219,947	25,532	306,779	70.9	98.4	75.6	9.9	.1	78.6	1.6	19.8
R. I.	"	142,460	61,329	130,017	142,460	136,072	34,068	78,426	142,460	-	-	91.3	100.0	95.5	23.9	55.1	100.0	0	0
Conn.	"	465,490	90,951	465,490	465,490	305,858	129,643	323,790	465,490	-	-	100.0	100.0	65.7	27.9	69.6	100.0	0	0
N. Y.	"	2,430,667	767,066	2,088,250	2,372,673	1,778,110	872,251	342,874	1,251,986	57,994	1,120,687	85.9	97.6	73.2	35.9	14.1	51.5	2.4	46.1
N. J.	"	16,742	3,771	0	16,742	1,417	-	-	16,742	-	-	0	100.0	8.5	0	0	100.0	0	0
Penna.	"	518,063	111,025	506,458	495,458	313,808	68,905	51,117	389,184	22,605	106,274	97.8	95.6	60.6	13.3	9.9	75.1	4.4	20.5
Delaware	"	6,186	242	6,186	6,186	-	-	-	6,186	-	-	100.0	100.0	0	0	0	100.0	0	0
Georgia	"	324,452	248,576	324,452	324,452	678	441	-	324,302	-	150	100.0	100.0	.2	.1	0	99.9	0	.1
Kentucky	"	114,312	31,199	114,312	114,312	-	-	-	114,312	-	-	100.0	100.0	0	0	0	100.0	0	0
Maryland	"	163,590	70,550	163,590	163,590	16,433	27,378	-	152,227	-	11,363	100.0	100.0	10.0	16.7	0	93.1	0	6.9
N. Car.	"	1,361,532	581,619	1,361,532	1,361,532	6,631	2,495	-	1,358,872	-	2,660	100.0	100.0	.5	.2	0	99.8	0	.2
S. Car.	"	77,008	45,398	77,008	77,008	25,935	-	-	77,008	-	-	100.0	100.0	33.7	0	0	100.0	0	0
Tenn.	"	1,075,545	464,530	1,075,545	1,075,545	15,827	4,175	-	1,055,988	-	19,557	100.0	100.0	1.5	.4	0	98.2	0	1.8
Va.	"	1,526,452	554,230	1,526,452	1,492,006	35,152	9,717	-	1,441,710	34,446	50,296	100.0	97.7	2.3	.6	0	94.4	2.3	3.3
W. Va.	"	707,620	262,966	707,620	707,045	111,071	14,670	-	541,849	575	155,196	100.0	99.9	15.7	2.1	0	76.6	.1	23.3
Sub-Total	State and Private	16,339,917	6,230,708	14,226,238	15,862,623	6,924,886	1,804,572	852,676	11,118,479	477,294	4,744,144	87.1	97.1	42.4	11.0	5.2	68.0	2.9	29.1

TABLE 47 (Continued) - STATUS OF BLISTER RUST CONTROL, BY STATES AND LAND OWNERSHIP CLASSES, IN THE NET CONTROL AREA OF THE NORTHEASTERN REGION - NOVEMBER 30, 1951

State	Land Ownership	Total Acreage	Acreage of White Pine	Acreage Detail Mapped	Net Acreage Worked: Pre-Maintenance Work: First	Net Acreage Worked: Pre-Maintenance Work: Second	Net Acreage Worked: Pre-Maintenance Work: Other	Net Acreage Worked: Maintenance Work	Acreage in Control Area: Now on Maintenance	Acreage in Control Area: In Need of Pre-Maintenance Work: First Work	Acreage in Control Area: In Need of Pre-Maintenance Work: Rework	Percentage of Control Area: Detail Mapped	Percentage of Control Area: Worked: Pre-Maintenance: First	Percentage of Control Area: Worked: Pre-Maintenance: Second	Percentage of Control Area: Worked: Pre-Maintenance: Other	Percentage of Control Area: Worked: Maintenance	Percentage of Control Area: On Maintenance	Percentage of Control Area: In Need of Pre-Maintenance Work: First Work	Percentage of Control Area: In Need of Pre-Maintenance Work: Rework
							National Forests												
Maine	White Mountain	2,305	1,000	2,305	2,305	881	120	-	759	-	1,546	100.0	100.0	38.2	5.2	0	32.9	0	67.1
N. H.	White Mountain	3,034	980	3,034	3,034	2,984	2,383	300	2,964	-	70	100.0	100.0	98.4	78.5	10.0	97.7	0	2.3
Vt.	Green Mountain	573	89	513	573	115	-	-	573	-	-	89.5	100.0	20.1	0	0	100.0	0	0
Penna.	Allegheny	4,085	957	4,085	4,085	2,815	821	-	2,015	-	2,070	100.0	100.0	68.9	20.1	0	49.3	0	50.7
Georgia	Chattahoochee	349,903	295,902	349,903	349,903	330	97	-	349,713	-	190	100.0	100.0	.1	.1	0	99.9	0	.1
Ky.	Cumberland	32,002	16,980	32,002	32,002	65	65	-	32,002	-	-	100.0	100.0	.2	.2	0	100.0	0	0
N. Car.	Nantahala	62,709	42,138	62,709	62,709	-	-	-	62,702	-	7	100.0	100.0	0	0	0	99.9	0	.1
"	Pisgah	161,752	92,697	161,752	161,752	2,943	1,780	-	158,535	-	3,217	100.0	100.0	1.8	1.1	0	98.0	0	2.0
S. Car.	Sumter	53,862	18,794	53,862	53,862	3,700	-	-	53,862	-	-	100.0	100.0	6.9	0	0	100.0	0	0
Tenn.	Cherokee	484,572	250,378	484,572	484,572	2,103	41	-	481,266		3,306	100.0	100.0	.4	.1	0	99.3	0	.7
Va.	Jefferson	107,474	55,084	107,474	107,474	3,737	856	-	102,869	-	4,605	100.0	100.0	3.5	.8	0	95.7	0	4.3
"	Geo. Washington	366,476	160,488	366,476	361,252	59,477	31,796	-	301,974	5,224	59,278	100.0	98.6	16.2	8.7	0	82.4	1.4	16.2
W. Va.	Geo. Washington	52,743	30,779	52,743	52,743	9,675	5,820	-	47,480	-	5,263	100.0	100.0	18.3	11.0	0	90.0	0	10.0
"	Monongahela	89,559	46,854	89,559	89,559	11,606	5,395	-	82,541	-	7,018	100.0	100.0	13.0	6.0	0	92.2	0	7.8
Sub-Total	National Forests	1,771,049	1,013,120	1,770,989	1,765,825	100,431	49,174	300	1,679,255	5,224	86,570	99.9	99.7	5.7	2.8	.1	94.8	.3	4.9
							National Parks												
Maine	Acadia	16,872	3,200	0	16,872	11,271	4,979	3,228	16,872	-	-	0	100.0	66.8	29.5	19.1	100.0	0	0
N. Car.	Blue Ridge	11,309	5,143	11,309	11,309	1,231	119	-	10,061	-	1,248	100.0	100.0	10.9	1.0	0	89.0	0	11.0
"	Great Smoky	27,407	12,106	27,407	27,407	413	360	-	21,358	-	6,049	100.0	100.0	.2	.1	0	77.9	0	22.1
Tenn.	Great Smoky	83,497	55,799	83,497	83,497	-	-	-	83,497	-	-	100.0	100.0	0	0	0	100.0	0	0
Va.	Blue Ridge	2,581	630	2,581	2,581	856	-	-	1,545	-	1,036	100.0	100.0	33.2	0	0	60.0	0	40.0
"	Shenandoah	14,270	3,080	14,270	14,270	5,012	4,111	-	12,790	-	1,480	100.0	100.0	35.1	28.8	0	89.6	0	10.4
Sub-Total	National Parks	155,936	79,958	139,064	155,936	18,783	9,569	3,228	146,123	-	9,813	89.2	100.0	12.0	6.1	2.1	93.7	0	6.3
							Indian Service												
N. Car.	Cherokee Ind. Res.	445	22	445	445	-	-	-	445	-	-	100.0	100.0	0	0	0	100.0	0	0
							All Ownerships												
GRAND TOTAL		18,267,347	7,323,808	16,136,736	17,784,829	7,044,100	1,863,315	856,204	12,944,302	482,518	4,840,527	88.3	97.4	38.6	10.2	4.7	70.9	2.6	26.5

Report

ON

WHITE PINE BLISTER RUST CONTROL

SOUTHERN APPALACHIAN REGION

1951

UNITED STATES DEPARTMENT OF AGRICULTURE

Agricultural Research Administration

BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE

Box No. 507

Room 208, Federal Building

HARRISONBURG, VIRGINIA

January 1952

WHITE PINE BLISTER RUST CONTROL ACTIVITIES

SOUTHERN APPALACHIAN REGION

ANNUAL REPORT FOR 1951

United States Department of Agriculture
Agricultural Research Administration
Bureau of Entomology and Plant Quarantine

Room 208, Federal Building
Harrisonburg, Virginia

FOREWORD

This will, in all probability, be the last annual report covering white pine blister rust control activities from the Southern Appalachian Region as such. As a result of the reorganization of the Bureau, this work in the southern Appalachian states will be handled as an area under the Northeastern Bureau Regional Office, located at Greenfield, Massachusetts. An attempt will be made to give a brief resume' of the work accomplished to date, the status of control and the probable future requirements by States, national forests and national parks. This report is prepared, insofar as practicable, following an outline prepared by Mr. C. C. Perry who is attached to the Greenfield Office. Should any additional information be required by cooperators it will be supplied from our files if possible.

PART I

GENERAL STATEMENT

Importance of White Pine

White pine represents a small percentage of the total annual lumber cut in the southern appalachian states but it is highly important and frequently the most valuable component of the timber stand in its ecological range. It is found in commercial quantities in 116 counties and its botanical range covers perhaps 300 counties including the Southern Appalachian Mountains, the Piedmont Area extending from northern Delaware through Georgia and much of the Cumberland Mountain range in Alabama, Tennessee and Kentucky. During recent years the average lumber cut was approximately 180,000,000 board feet per year with a stumpage value of approximately $2,750,000. During 1950-1951 a study was made of the present and potential volume and value which is shown on page 5.

White pine was an important species in the virgin timber stands of these states but was almost eliminated in many cases by cutting and fire. With effective fire control during the past 20 years it has increased tremendously. With the death of the chestnut, much of this natural reproduction had an opportunity to reach maturity. In many cases, however, reproduction was killed by other species due to the lack of proper timber management. Since about 1930 there has been a marked increase in the planting of white pine each year until the war. Since that time there has been an even greater increase. One of the major factors in this recent increase in planting is the development and use of planting machines with a corresponding reduction in cost per acre. An increased amount of this planting is carried on in the southern portion of the region during the fall and winter months. Most of the white pine occurs in mixed stands which produces a higher quality of lumber even though its yield per acre would be less than that of pure stands.

The rate of growth of white pine in this region as a whole equals or excels that of any other part of the country. There is a great need for improved timber management and marketing methods even though work along these lines has been started in recent years. With adequate fire control, timber management, improved marketing and the absence of wild ribes through much of the white pine growing region these states could well become an important source of the nation's future white pine lumber needs.

Pine Infection

Blister rust has been found on white pine in Maryland, West Virginia, Virginia, Tennessee and North Carolina. With very few exceptions there has been no commercial damage from the rust. Most of the infections are found at the highest elevation range of white pine where the density and quality is least. The heaviest concentrations of ribes generally occur well above the best white pine. Approximately 90% of the acreage supporting commercial white pine is naturally free of wild ribes. Where the rust has been present for a

number of years it has in many cases practically eliminated white pine from the stand. Climatic conditions usually appear to be unfavorable for the spread of the disease, although at intervals of about five to six years meteorlogical conditions apparently favor the rust and epidemic conditions are noted.

In addition to the above states, the rust has been found on ribes only in Delaware and Georgia. The rust is now so distributed throughout this area that during a favorable year practically any ribes bush within the botanical range of white pine could become infected.

Accomplishments of Control Program to Date

Scouting for blister rust was begun in this area in 1911 or earlier. Some ribes eradication work was carried on as early as 1922 but an extensive program did not get underway until 1933. Since that time survey has been completed on over 3-1/4 million acres of white pine and 7-1/4 million acres of control area. The survey is practically completed except for the small amount which will be necessary to keep up with changing conditions. Ribes eradication has been carried on, where necessary, in practically all of this control area. Wild bushes were removed from about 700,000 acres. Second work was performed on over 300,000 acres and three or more workings on about 100,000 acres. About 95% of the control area is now on maintenance. Good progress has been made on survey to determine the occurrance of wild ribes regardless of their proximity to native white pine. This information is being used as a guide by foresters as they attempt to extend the range of white pine through planting wherever practicable.

Methods Development

Considerable progress has been made in improving techniques for ribes eradication and conducting white pine surveys. The methods of survey vary from simple ocular estimates to 5% samples. An attempt has been made to obtain and record only that information necessary to determine the economic possibility of attempting control work. In only a few cases did the control prove ineffective. These were due to situations which could not be recognized or anticipated at the time the work was performed or because funds were not available to continue ribes eradication.

Changes have been developed in the method of ribes eradication, the principle ones being the reduction in the size of the crew and the use of chemicals. For the region as a whole the recently developed herbicides have found only limited use. Most work in the future will be on ground from which the bushes have previously been destroyed. Eradication will consist of finding and destroying scattered individual bushes or relatively small patches. These small, shallow rooted bushes can be destroyed by hand in less time than would be used to apply chemicals. Rust resistant cultivated ribes have been obtained and tried out throughout the region but as yet there has been no popular demand for them. Cultivated ribes are of very little importance throughout most of the region.

Several selections of rust resistant white pine were obtained in 1949 and in 1951 which are being tried out in different parts of the region. Considerable interest has been shown on the part of foresters and nurserymen in these selections. While several major problems remain, we can see the possibility for widespread use of such trees particularly for ornamental use and perhaps establishing resistant white pines at high elevations in association with ribes.

Continuing Problem

In light of the present knowledge it appears that it will be necessary to continue searching for and destroying wild ribes where their presence is a menace to valuable white pine. The following is an operation plan which was prepared during the year to meet the work needs as it now appears.

BLISTER RUST CONTROL OPERATIONS PLAN
FOR
SOUTHERN APPALACHIAN REGION

Most of the white pine stands in the Southern Appalachian states now classified as worth saving have been protected from blister rust by the natural absence or removal of ribes. This work has established control of the disease in these stands. The remaining task is to maintain this condition in these stands and give protection to new ones resulting from natural reproduction and planting. The following is a resume' of the situation, an estimate of the future needs and a work plan for meeting the problem on all ownerships except National Parks.

Relationship Between the Host Plants, the Disease and its Control

Forests are composed of growing plants and are constantly undergoing a process of change. White pines and ribes are present in various stages of growth from seeds to mature plants. The immature pines, which will furnish the next crop of timber need to be protected from blister rust by ribes eradication. Small ribes seedling plants and ribes seeds in the soil cannot be found and removed at the time the older plants are destroyed. Logging, fire, windthrow and other disturbances create conditions favorable for the growth of ribes. Therefore, white pine stands must be watched for the appearance of ribes resulting from seed or from seedlings too small to be found at the time the larger bushes were destroyed.

The blister rust fungus cannot be eradicated, it will always be present in white pine forests and will continue to damage these stands in areas where it is not kept under control. The disease is controlled by freeing white pine stands of ribes, the alternate host, and keeping them sufficiently free of these plants so that no commerical damage can be done by the rust. This requires initial removal of existing ribes within 900 feet of white pine stands and inspection at intervals of several years to destroy any of these plants that appear later in the forest cycle.

Other work needed to maintain control of the rust includes the eradication of ribes in areas where new stands are developing from natural regeneration, the selection of planting sites relatively free of ribes, resurveys to keep up with the changes in white pine areas, the enforcement of quarantines, the continuation of disease and host plant surveys, the encouragement of white pine management practices that aid ribes suppression, and the preparation of informational material on the control of the disease. The work is conducted cooperatively by Federal, State, and private agencies.

White Pine Conditions

White pine is found in commercial quantities in 116 of the counties that comprise the ten states of the region. It occurs generally in what is described as the Southern Appalachian hardwood region. It is usually in mixture with other species below the ecologic range of spruce and fir and above that of Virginia pine and short leaf pine. Most of the white pine is in the Blue Ridge and Appalachian ranges and in the Cumberland Mountain section of Kentucky and Tennessee. Isolated native and naturalized stands occur in the coastal plains near sea level in Delaware, Maryland and Virginia. Similar stands, scattered individual trees and successful plantations exist at elevations far below its optimum range in all of the other states in the region. Significant increases in density and extent of native white pine have been noted during the last thirty years. This, together with continued fire control and improved timber management practices, will no doubt greatly increase the white pine yield in future years.

The following table shows the acreage, volume and value of white pine according to recent estimates. The acreage includes all white pine regardless of whether or not it is worth protecting. The acreage shown under saw timber contains some immature growth and vice versa. Therefore, the division of these two classes is an estimate.

PRESENT AND POTENTIAL WHITE PINE
BY STATE AND OWNERSHIP

State	Ownership	Saw Timber		Immature Growth		Value**
		Acres	Volume*	Acres	Potential Volume*	
Delaware	St. & Private	-	-	242	2.5	50
Georgia	Chatt. N.For.	20,000	90.0	275,902	855.3	16,545
	St. & Private	31,600	102.2	216,976	623.3	12,695
	Sub-Total	51,600	192.2	492,878	1,478.6	29,239
Kentucky	Cumb. N.For.	1,415	7.6	15,565	125.2	2,655
	St. & Private	10,585	67.4	20,614	125.0	3,848
	Sub-Total	12,000	75.0	36,179	250.2	6,804
Maryland	St. & Private	7,000	36.0	63,716	130.0	3,320
North Carolina	Pisgah N.For.	20,000	56.0	116,000	297.8	6,368
	Nanta. N.For.	31,083	62.0	11,000	34.1	1,922
	B.R.Parkway	95	1.2	5,048	40.2	745
	G.S.M.N.Park	1,000	6.0	40,652	275.0	4,215
	Cher. Ind.Res.	200	.1	22	.3	4
	St. & Private	71,922	280.9	520,346	1,119.2	28,003
	Sub-Total	124,300	406.2	693,068	1,766.6	41,257
South Carolina	Sumter N.For	3,800	1.9	25,000	66.5	1,915
	St. & Private	12,000	14.3	33,398	83.5	2,738
	Sub-Total	15,800	16.2	58,398	150.0	4,653
Tennessee	Cherokee N.F.	108,000	96.0	142,378	441.4	9,673
	G.S.M.N.Park	52,000	35.3	4,500	27.5	942
	St. & Private	100,000	363.2	364,530	859.4	21,396
	Sub-Total	260,000	494.5	511,408	1,328.3	32,011
Virginia	Geo.Wash.N.F.	29,000	50.0	125,549	376.5	7,679
	Jeff. N.For.	20,000	10.0	35,084	105.3	2,075
	Shen. N.Park	600	1.0	3,000	18.0	285
	B.R.Parkway	-	-	2,100	31.5	567
	St. & Private	59,900	351.9	461,583	1,054.9	26,026
	Sub-Total	109,500	412.9	627,316	1,586.3	36,632
West Virginia	Geo.Wash.N.F.	1,538	9.0	29,241	87.7	1,741
	Monon. N.For.	5,000	19.0	41,854	85.0	1,872
	St. & Private	93,462	316.3	180,000	555.0	21,782
	Sub-Total	100,000	344.3	251,095	727.7	25,395
TOTALS FOR REGION	Nat. Forests	239,836	401.5	871,573	2,474.9	52,444
	Nat. Parks	53,695	43.5	55,300	392.2	6,754
	Ind. Res.	200	.1	22	.3	4
	St. & Private	386,469	1,532.2	1,861,405	4,552.8	119,859
	GRAND TOTAL	680,200	1,977.3	2,734,300	7,420.2	179,061

* Board Feet in millions.
** Stumpage in thousands of dollars.

Ribes Conditions

The following native species of ribes have been reported within the region: R. oxyacenthoides, R. lacustre, R. hirtellium, R. glandulosum, R. missouriensis, R. curvatum, R. rotundifolium and R. cynosbati. The first three are so seldom found that they are of little importance; the next three are quite limited in distribution but sometimes occur in association with white pine. The last two are more widespread. Wild ribes seem to follow, with some exceptions, a fairly definite pattern regarding elevation. In Maryland they are frequently numerous above 2,000 feet and seldom found under 1,000 feet. In Georgia they are generally numerous above 5,000 feet and infrequent under 4,000 feet except for R. curvatum and in some cases R. cynosbati. The latter is seldom found below 3,000 feet in the Blue Ridge Mountains. In the Cumberland Mountains of Tennessee they are found at about 1,000 feet. The elevation for ribes growth in the remainder of the region varies between these limits according to the latitude. The bushes are generally most numerous in rocky, moist sites and on cool exposures. Old bushes sometimes die out and the "comeback" under dense shade is very light following eradication. The control of forest fires since about 1910 may have been largely responsible for most of the increase in white pine and the decrease in wild ribes. Ribes range from zero to several thousand per acre. On initial working of ribes bearing control areas throughout the region ribes were found to average about 45 bushes per acre. On second working the average number found on these sites was about 14 per acre. One or two reworkings greatly reduce the number of ribes per acre on the sites most favorable for them and practically eliminate them from the less favorable sites.

Rust Conditions

Blister rust was first reported in the region in northern Virginia in 1911 when a single infected tree was found and destroyed. This tree was imported before quarantines were established. Fortunately it was found before the disease became established locally. The rust spread by windborne spores southward into the region from the Northeast and by 1924 had become fairly well distributed throughout northern portions of Virginia, West Virginia and western Maryland. Control work was begun in 1933. Since then it has been found in Delaware, North Carolina, Tennessee and Georgia. Most of the infection south of the James River in Virginia is in isolated stands or on individual trees. The scattered white pine growth at high elevations in association with numerous wild ribes are uneconomical to protect. While the rust will continue to spread in these places, no serious damage will occur to the valuable white pine stands at lower elevations as long as the ribes population is kept suppressed. Extensive spread of the rust from ribes to pine occurs only when the weather is relatively cool and moist. The weather conditions in the region vary widely and affect local spread of the rust from year to year. While no specific data are available, it seems probable over any given period of time, there will be fewer years in the Southern Appalachian Region favorable for the spread of the rust than in cooler climates. Observations indicate no marked difference in the development of the rust after it has become established in a white pine regardless of its location in the region.

Status of Program

The following table shows the control problem and the status by states and land ownership according to blister rust control records as of December 1950.

TABLE I

STATUS OF BLISTER RUST CONTROL - DECEMBER 1950

State	Ownership	White Pine	Control Area		Status of Control	
			Ribes Bearing	Ribes Free	Worked	On Maintenance *
		(Acres)	(Acres)	(Acres)	(Acres)	(Acres)
Del.	St. & Private	242	-	6,186	6,186	6,186
Md.	St. & Private	70,716	28,887	135,638	164,525	152,818
Virginia	Geo.Wash.N.F.	154,549	119,737	235,441	350,224	287,815
	Jeff. N.F.	55,084	12,853	94,621	107,474	102,869
	B.R.Parkway	630	1,037	1,544	2,581	1,545
	Shen. N.Park	3,080	10,077	4,193	14,270	12,560
	St. & Private	521,483	136,785	1,326,075	1,422,966	1,373,100
	Sub-Total	734,826	280,489	1,631,874	1,897,515	1,777,889
West Va.	Geo.Wash.N.F.	30,779	9,113	43,630	52,743	47,480
	Mon. N.Forest	46,854	12,426	77,133	89,559	82,541
	St. & Private	262,966	247,336	460,284	707,045	541,849
	Sub-Total	340,599	268,875	581,047	849,347	671,870
North Carolina	Nanta. N.For.	42,063	7	63,137	62,709	62,702
	Pisgah N.For.	79,819	4,103	150,661	154,754	150,479
	B.R.Parkway	5,143	1,248	10,061	11,309	10,061
	G.S.M.N.Park	12,106	870	26,537	27,407	21,358
	Cher. Ind.Res.	22	-	445	445	445
	St. & Private	592,268	6,141	1,358,053	1,362,948	1,360,369
	Sub-Total	731,441	12,369	1,608,894	1,619,572	1,605,414
Tenn.	Cher. N.For.	250,378	4,113	480,459	484,572	481,266
	G.S.M.N.Park	55,799	-	83,497	83,497	83,497
	St. & Private	464,530	30,358	1,045,188	1,075,364	1,055,988
	Sub-Total	770,707	34,471	1,609,144	1,643,433	1,620,751
Ky.	Cumb. N.For.	16,980	65	31,937	32,002	32,002
	St. & Private	31,199	-	114,312	114,312	114,312
	Sub-Total	48,179	65	146,249	146,314	146,314
Ga.	Chatt. N.For.	295,902	1,122	348,781	349,903	349,715
	St. & Private	248,576	2,582	322,340	324,452	324,302
	Sub-Total	544,478	3,704	671,121	674,355	674,015
South Carolina	Sumter N.For.	18,794	-	53,862	53,862	53,862
	St. & Private	45,398	-	77,008	77,008	77,008
	Sub-Total	64,192	-	130,870	130,870	130,870
REGION TOTALS	Nat. Forests	991,222	163,539	1,579,662	1,737,802	1,650,729
	Nat. Parks	76,768	13,232	125,832	139,064	129,021
	Ind. Res.	22	-	445	445	445
	St. & Private	2,237,378	452,089	4,845,084	5,254,808	5,005,932
	GRAND TOTAL	3,305,280	628,860	6,651,023	7,132,117	6,786,127

* Maintenance is used to designate a white pine forest condition wherein ribes eradication and natural factors have brought blister rust under practical control. This condition is maintained by periodic inspection of ribes conditions and eradication of any bushes large and numerous enough to endanger the pines.

Each cooperating agency provides funds for control work on its own lands and sometimes on adjoining lands when necessary to obtain a satisfactory protection zone. Areas on which ribes are present or from which they have been previously removed are a potential future problem and in planning control operations consideration must be given to changes in ribes and pine conditions. Experience shows that ribes seldom come back on all of the acreage from which they were originally removed. In some cases this reduction amounts to 50% or more, but once ribes have been found on a given area it is a potential ribes-bearing site for many years. Such sites require periodic rework until the ribes potential is eliminated. Ribes seed can remain viable in the forest floor for the life of a stand and then germinate following logging and soil disturbance.

There will be some variation in the amount of maintenance work between districts from year to year but the principle jobs are as follows:

1. Inspection of Ribes Sites: Each year examine, on a rotation schedule, a portion of the ribes sites in each district to determine the "comeback" of ribes and the need for reworking. Detailed plans must be carefully made for this reworking to insure maximum efficiency. Inspection work is scheduled for the months of July, August and September.

2. Removal of Ribes: Each year rework those sites which have been determined by the previous year's inspection to be in need of ribes eradication. Also, remove ribes from planting sites and new areas naturally regenerating to white pine. This work should be scheduled for April, May and June, and beginning when the leaves start to emerge on the ribes bushes. Ribes eradication can be carried on most efficiently during this period of the year.

3. Resurvey of White Pine: The acreage, quantity, and quality of white pine undergoes constant change. Each year a portion of the control area should be resurveyed to locate changes in white pine areas and stocking affecting control plans for each district. This includes location and mapping of new white pine plantations, sites naturally regenerating to white pine, areas logged, burned or windthrown and areas under intensive management. Special attention should be given to disturbed areas where ribes might regenerate. This work is scheduled for the period October to March.

4. Ribes Survey: Information on the distribution of wild ribes is needed in order to make intelligent recommendations concerning the future planting of white pine. The planting program is growing rapidly with indications of continued expansion in the future. During 1950 nearly five million white pine seedlings were planted in the region. This planting is directed by several agencies and their field representatives are not always familiar with the nature of blister rust and its control. Control operators must keep in close contact with these agencies, in order to prevent white pine from being planted in association with wild ribes. It is difficult to estimate the amount of time and work required due to the wide range of conditions under which these trees are planted. If we consider five million trees in pure plantations of five acres each, it would mean that the control operators should pass upon about 1,000 plantation sites per year. This work is scheduled to be carried on along with other field operations during the year.

5. Quarantine Enforcement: Blister rust field men render valuable assistance to State Regulatory officials in making field inspections in connection with the enforcement of quarantines restricting the movement of cultivated ribes. These inspections are usually made from January to March since this is the season in which most nurseries receive orders for spring shipments.

6. Nursery Sanitation: White pine planting stock for reforestation purposes is kept free from blister rust infection by periodic inspection of producing nurseries and their environs to find and remove any wild or planted ribes within infecting range of the pines. One or more of such nurseries are located in most of the cooperating states. This work has been carried on since the beginning of the program but some follow-up is necessary during the spring months.

7. Educational Work: An informational program is conducted to keep land owners informed regarding the blister rust danger to white pine and to encourage them to aid in its control. Educational work, like the entire program, is in cooperation with the different state agencies. The states facilities for encouraging better fire control, timber management, erosion control and other phases of conservation can be utilized in this work. The educational work is carried on throughout the year with special emphasis during the winter months and in the counties where the work is to be carried on that year. It keeps pine owners up to date on the blister rust control problem and brings it to the attention of the younger generation who will be the pine owners of the future.

8. Blister Rust Surveys: A small amount of scouting for blister rust infection is carried on each year, especially in the counties where rust is relatively light. When results indicate an unusually favorable year for rust development, more extensive scouting is carried on to determine the limits of spread. This is most important in the southern part of the region where the rust is scattered and relatively scarce.

9. Cooperation with Other Agencies: Blister rust control organizations have a direct interest in aiding pine owners and land managing agencies and in encouraging better forest practices. Such practices increase the quantity and quality of white pine per acre thereby reducing the relative cost of blister rust control. Good forest practices usually result in a forest canopy which is an important aid in suppressing ribes and reducing eradication costs. We also are interested in preventing attempts to grow white pine where the cost of controlling blister rust is excessive.

The map of the region shows three main districts as follows:

District I.	North Carolina, Tennessee and Georgia
District II.	Virginia
District III.	West Virginia

The remaining work in Alabama, South Carolina, Kentucky, Maryland and Delaware can be handled directly from the Regional Office.

The following work schedule represents our best estimate of existing work needs by districts as shown on the following map.

WHITE PINE BLISTER RUST
PROPOSED ORGANIZATION
1951

Control Area Counties

Regional Office

District Offices

District #I

District # II

District # III

By Regional Office

SOUTHERN APPALACHIAN STATES

DISTRICT I

This district consists of the states of North Carolina, Tennessee and Georgia and has about 2,000,000 acres of white pine with a control area of over 3,000,000 acres. Ribes have been found on about 50,000 acres of the control area. This acreage is distributed over 28 counties and varies from 7 to over 6,000 acres per county. Control work in this district is scheduled on a ten-year rotation basis. The work is divided as nearly as possible into an equal work load for each year. Also, it is confined to as few counties as possible each year to keep down costs and hold travel to a minimum. One full-time control operator is required for these three states. The work schedule is as follows:

WORK SCHEDULE

DISTRICT I

Fiscal Year	County	Acres Eradication Or Inspection			Man-Days			Program Cost *		
		F.S.	Coop.		F.S.	Coop.		F.S.	Coop.	
			Tenn.	N.C.		Tenn.	N.C.		Tenn.	N.C.
1952	Bladsoe Rea. Cumb.	-	6,538	-	-	528	-	$ -	$4,200	$ 500
1953	Cumb. Font. Mor. Scott	-	6,664	-	-	545	-	-	4,400	-
1954	Ashe Johnson	1,042	3,437	795	94	298	71	900	2,500	600
1955	Johnson Carter	-	6,925	-	-	533	-	-	4,300	-
1956	Carter	242	5,816	-	24	479	-	200	3,900	-
1957	Ave. Watau Wash. Sull	1,054	2,169	3,827	93	190	301	900	1,700	2,400
1958	Mitchell Yancey	3,361	-	613	285	-	48	2,300	-	500
1959	Buns. Mad. Unicoi	1,734	2,506	370	164	213	39	1,800	1,800	400
1960	Hay. Monr. Polk et al	1,235	598	1,782	200	87	305	3,000	1,000	2,500
1961	Georgia	1,122	3,052	-	75	220	-	600	1,900	-

* Based on present cost of labor.

DISTRICT II

This district consists of the state of Virginia. It has nearly 750,000 acres of white pine with a control area of over 1,500,000 acres. Ribes occur on nearly 300,000 acres of the control area. About 150,000 acres involves cooperative control work on state and privately owned white pine lands and the remainder on national forest lands.

The work load is divided as equally as possible over an eight year period and in contiguous areas. One control operator and two assistants are needed to do the work. The most urgent work in the northern counties is scheduled for completion in 1952 and the rotating plan will be put into effect July 1952. The work schedule is as follows:

WORK SCHEDULE

DISTRICT II

Fiscal Year	County	Acres Eradication Or Inspection		Man-Days		Program Cost*	
		Forest Service	Coop.	Forest Service	Coop.	Forest Service	Coop.
1953	All South of Allegh. Rockb &Am.	19,643	42,215	1,220	2,480	$ 9,000	$ 18,000
1954	All.&Bath	15,729	11,903	1,415	1,070	10,600	8,300
1955	Bath & Highland	21,721	19,000	2,695	2,500	20,000	18,300
1956	Highland Bath & Augusta	24,941	17,151	3,695	2,545	25,000	19,000
1957	Aug.,Alb., Amh, Nel., & Rockbr.	23,623	12,489	3,700	1,960	27,000	14,500
1958	Rock. Aug. & Bath	24,000	15,483	3,360	2,165	25,000	16,000
1959	Rockingham	19,374	17,324	3,695	2,420	27,500	18,000
1960	Rockbridge Green & Highland	20,053	19,164	3,150	2,530	23,300	18,500

* Based on present cost of labor.

This district consists of the state of West Virginia with over 340,000 acres of white pine in a control area of about 850,000 acres, of which about 268,000 acres contain ribes. The pine is found in the twelve eastern counties. About 225,000 acres involves cooperative control work on state and private lands and 43,000 acres on national forest lands.

This plan is prepared on the basis of biological need. The work program has not been large enough to keep pace with the spread of the rust. At the present rate of progress a large amount of the state and privately owned white pine is expected to suffer severe damage.

Personnel needs to handle the work requires one control operator in charge of the work with an assistant in Hardy or Pendleton County and another in Summers and Monroe County. If this force can not be provided, one or two should be retained. Some white pine resurvey work is needed in Hardy and Monroe Counties to complete the pine information. This has been postponed because there was little need for conducting further survey until the white pine already surveyed was protected. The work schedule for this district is as follows:

Fiscal Year	County	Acres Eradication Or Inspection		Man-Days		Program Cost*	
		Forest Service	Coop.	Forest Service	Coop	Forest Service	Coop
1952	Hardy, Pen. Greenbrier & Raleigh	10,571	18,000	1,356	1,829	$ 11,900	$ 14,800
1953	Hardy, Pen. Greenbrier & Raleigh	4,071	31,587	875	5,181	7,000	41,700
1954	Hardy, Pen. Greenbrier & Raleigh	2,621	35,908	363	2,923	3,000	20,500
1955	Hardy, Pen. Pocahontas & Mercer	1,981	42,000	246	3,419	2,000	27,500
1956	Hardy, Pen. Pocahontas & Mercer	7,423	36,953	587	5,232	4,700	42,100
1957	Hardy, Pen. Tuck. Mer. & Monroe	5,162	40,359	468	3,266	3,800	26,500
1958	Hardy, Pen Hamp. Summ. & Greenb.	5,622	20,281	444	1,629	3,500	12,200
1959	Hardy, Pen. Greenbrier & Raleigh	7,071	24,318	683	1,924	5,700	15,500
1960	Hardy, Pen. Greenbrier & Raleigh	4,107	31,587	474	2,541	3,900	20,400
1961	Hardy, Pen. Pocahontas & Raleigh	2,621	35,908	299	2,858	2,400	22,000

* Based on present cost of labor.

Complete working for State except for 4,000 acres on Mon. Nat. For.

RECAPITULATION - WORK PLAN COST

SOUTHERN APPALACHIAN REGION - BY DISTRICTS

LABOR AND FIELD OPERATION ONLY

Fis. Yr.	District I		District II		District III		Other	TOTAL	
	F.S.	Coop.	F.S.	Coop.	F.S.	Coop.	Coop.	F.S.	Coop.
'52	-	44,200T	$50,000	$17,000	$1,900*	$14,800*	$ 2,000M	$1,900	$38,000
'53	-	4,400T	9,000	18,000	7,000	41,700	-	16,000	64,100
'54	900	2,500T 600N	10,600	8,300	3,000	20,500	-	14,500	31,900
'55	-	4,300T	20,000	18,300	2,000	27,500	3,000M	22,000	53,100
'56	200	3,900T	25,000	19,000	4,700	42,100	3,000M	29,900	68,000
'57	900	1,700T 2,400N	27,000	14,500	3,800	26,300	**4,000M	31,700	48,900
'58	2,300	500N	25,000	16,000	***3,500	**12,200	-	30,800	28,700
'59	1,800	1,800T 400N	27,500	18,000	5,700	15,500	-	35,000	35,700
'60	3,000	1,000T 2,500N	**23,300	*18,500	3,900	20,400	-	30,200	42,400
'61	600	1,900G	10,000	15,000	2,400	22,000	-	13,000	38,900

* Beginning of present rotation.
** End of present rotation.
T Tennessee
N North Carolina
G Georgia
M Maryland

NOTE: Costs shown in this table are for labor at 1951 wage rates and field operation.

Summary:

The foregoing work plan is believed adequate to maintain control of the disease on the present white pine areas under protection and to provide initial protection for future plantations and newly established native pine areas. However, many unpredictable factors could arise during the next ten years to require changes in these plans. Costs are based upon present wage rates. They cover payrolls and provide for field operations. Salaries of supervisors and most of their expenses are not included.

PART II

LEADERSHIP, COORDINATION AND TECHNICAL DIRECTION

Organization and Personnel

During June the Bureau established five regional administrative offices covering the country. These were located at Greenfield, Mass., Gulfport, Miss., Minneapolis, Minn., Berkley, Calif., and San Antonio, Texas. These offices were established to handle the administrative functions for all Bureau activities falling within their regions. Administrative as well as technical direction of the control projects was, with few exceptions, likewise reorganized. In the Southern Appalachian Blister Rust Control Region the states were divided as follows: Alabama, North Carolina, Tennessee, South Carolina and Georgia were set up in Region II with headquarters at Gulfport; Kentucky is in Region V with headquarters at Minneapolis and West Virginia, Virginia, Maryland, Delaware and the District of Columbia in Region I at Greenfield; all blister rust control work, however, is to be handled as an area with both administrative and technical direction to come from Greenfield. The Greenfield office is under the direction of Mr. Roy G. Richmond, Regional Director and Mr. E. C. Filler, project leader in charge of blister rust control activities.

At the beginning of the year there were fifteen appointed persons on active duty. As of December 31 there were eleven; one of whom had completed arrangements for transferring to another position within the Bureau effective January 7, 1952. Mr. Ralph W. Welch, formerly area leader was on leave without pay throughout the year and is recuperating from a prolonged illness at Albuquerque, New Mexico. The seasonal labor load varied as usual during the year with a maximum of 190 during the height of the eradication season. Henry E. Yost was appointed Regional Leader following the resignation of J. Curtis Ball which was effective in December of 1950. Effective July 1, administrative functions formerly handled at Harrisonburg were transferred to Greenfield. The position of administrative assistant and one clerk were abolished and one clerk transferred to Washington, effective January 7, 1952. This leaves a supervisory force consisting of two technical men, one clerk-stenographer and seven field supervisors. The 1951 staff was as follows:

Regional Office, Harrisonburg, Virginia

Henry E. Yost	Regional Leader, Effective 2/4/51
John R. George	Asst. Regional Leader
Ralph W. Welch	Area Leader. On LWOP throughout year.
Edward G. Schmidt	Administrative Assistant. Transferred to Bureau Regional Office, Gulfport, Miss. 7/1/51
Emily M. Lonergan	Clerk-Stenographer
Bernice M. Yeakle	Clerk. Terminated 6/30/51 RIF
Audrey J. Franklin	Clerk-Stenographer. Terminated 12/28/51 RIF
B. Frances Gardner	Clerk-Stenographer, Terminated 11/23/51 RIF Transferred to Bureau office of Stored Products Insects, Washington, D. C.

Field

George C. Cramer	Field Supervisor, Mt. Solon, Virginia
Joyce L. Cramer	Clerk, Mt. Solon, Virginia. Termination in early January - RIF. Will be transferred 1/7/52 to Bureau office of Stored Products Insects, Washington, D. C.
Maxine P. Ford	Clerk, Asheville, N.C. (Paid from North Carolina funds) Terminated July 1951.
Clarence M. Fultz	Field Supervisor, Lost River, W. Va.
Delbert L. Gillispie	Field Supervisor, Arbovale, W. Va.
Glenden E. Keaton	Field Supervisor, Pipestem, W. Va.
Martin Q. Miller	Field Supervisor, Staunton, Virginia
Edward L. New	Collaborator - Tennessee (Seasonal)
Charles A. Rodamer	Control Assistant, Harrisonburg, Va.
Walter A. Stegall, Jr.	Field Supervisor, Asheville, N.C.

National Park Service

Fields Benton, Checker	Shenandoah National Park, Luray, Virginia
Roy Whaley, Checker	Great Smoky Mts., National Park, Gatlinburg, Tennessee

Informational and Services Activities

In general the informational program was carried on much the same as during recent years. The following list summarizes the activities for the year together with the approximate average for the period 1948 through 1951, inclusive.

Summary of Informational Activities

	1951		Avg. 1948-51, Incl.	
	No.	Attendance	No.	Attendance
News items published	15		10	
Radio programs	-		1.5	
Motion pictures shown	52	3,009	142	12,250
Meetings & demonstrations	30	628	30	1,725
Exhibits at fairs, etc.	21	294,850	12	125,000
Publications distributed	4,959		4,500	

Particular emphasis was placed on contacting forest and park service rangers as well as farm foresters. About half of the exhibits consisted of the mechanical exhibit which was prepared and placed in use two years ago, the others were prepared largely from native material and in many cases were in cooperation with other conservation agencies. In some instances moving pictures were shown through indirect projection on a small screen. An intensive effort was made to show moving pictures in those counties in western North Carolina where rust was recently discovered. As in the past, we have had excellent cooperation from the Extension Service, State Foresters, TVA and others in showing blister rust moving pictures. Blister rust was discussed at a Plant Pathology Seminar at West Virginia University and before general and forest pathology classes at Virginia Polytechnic Institute in Blacksburg, Virginia.

Automotive Equipment

The following vehicles were on hand December 31, 1951.

3	passenger cars
2	suburban carryall trucks
7	sedan delivery trucks
14	panel trucks
1	pick-up truck
1	stakeside truck, 1½ ton
4	ambulance trucks, ½ ton
32	total

There were no additions to our fleet during the year. One passenger car was transferred to Greenfield while one stakeside truck and one panel truck were released as surplus property to County School Boards in Virginia.

Cooperation with Other Agencies

The same general cooperative arrangements as have been used for several years remained in effect. Work on state and private lands was handled by the Bureau representatives. The cost of practically all of the labor was paid from non-federal funds. The Virginia Hot Springs Corp., of Hot Springs, Virginia, made available about $700.00 for eradication of wild ribes to protect white pine plantations surrounding their hotel and golf course.

The Park Service continued to operate their blister rust control work with the Bureau acting as technical advisors on the Shenandoah and Great Smoky Mountains National Parks. The Bureau did all the work on the Blue Ridge Parkway and was reimbursed by the Park Service. The Forest Service project continued to be operated entirely on a reimbursement basis. During the year the Forest Service has completed arrangements to employ a man on the George Washington National Forest approximately one-half time on blister rust control and the remainder of his time on sale area betterment work. His main responsibility will be examining the lower value white pine areas to determine just where the control work shall end. In addition, he will coordinate more closely the blister rust activities with the Forest Service timber management program. It is hoped that this man will be available as a consultant on other forests in Region 7.

At the request of the West Virginia University and with the approval of the Chief of the Bureau, blister rust men assisted in scouting for oak wilt in West Virginia. This disease was found in several locations in the Southern Appalachian States and has aroused considerable interest on the part of the foresters and others interested in conservation of the timber resources.

The usual cooperative arrangements were carried on in connection with state and federal forests for the use of blister rust men in fighting fires. Fortunately they did not find it necessary to call on us during the year.

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COOPERATIVE BLISTER RUST CONTROL ON STATE AND PRIVATE LANDS

This section of the report is intended to give a brief resume of past work, the present status and future requirements for blister rust control on state and private lands by states. Minor references are occasionally made to federal holdings. Detailed statistics are given in the tables at the end of the reports.

Alabama

Alabama is not considered a white pine state under Quarantine No. 38, even though reports indicate over one million seedlings of white pine were put in 1911 and lesser amounts in earlier years. Only one planting information was available regarding native white pine and very little scouting carried on prior to 1934. During late February and early March W. A. Bergoll and H. E. Yost spent a few days scouting for ribes and white pine. Between 15,000 and 20,000 white pine were planted on the Talladega National Forest during the winters of 1949-1950 and 1950-1951. These were underplanted in cut-over areas in stations where the present cutting was more severe than usual because of little leaf disease on short leaf and to a lesser extent loblolly pine. The result of these plantings remain to be seen but so far there was good survival and at least average growth on the older trees. A few white pine had been planted on the forest about 1937. These trees made excellent growth except where they were suppressed by other species. Native white pine was found in one location on the Benkwood on Coney Creek. One old white pine seed tree was found with a small amount of reproduction surrounding it. This varied from seedlings up to small pole size trees. If the little leaf disease continues, white pine may be planted more extensively throughout the state.

Very little information is available regarding ribes in the state. Native curvatum were found making excellent growth on the DeSoto State Park in DeKalb County by Bergoll and Yost on March 3, 1951. The bushes were growing at an elevation of about 2,000 feet, were almost in full leaf and growing in what is considered a typical curvatum site for the Cumberland Mountains. Reports from the United States Herbarium indicated R. cynosbati growing in two locations in Jackson County. Curvatum was also reported from Jefferson County. No ribes were observed by Bergoll and Yost except the first noted above, although there were many favorable sites found in DeKalb, Jackson, Madison, Lawrence, Franklin, Marion and Winston Counties. If wild ribes are present they would likely occur on very specific sites and relatively small areas. Many cases have been observed elsewhere in the region where cultivated ribes have escaped from seed or vegetatively. Such bushes sometimes show characteristics of species entirely foreign to that particular locality. It is possible that this is the case of the reports of cynosbati in Alabama.

From a blister rust control standpoint, white pine can be recommended for general planting in Alabama, although more caution for ribes would be desirable.

Delaware

Scouting for blister rust was started in Delaware at least as early as 1918. During 1920 many cultivated ribes were destroyed in the state, particular emphasis was placed on eradication of R. nigrum. Most of this work was carried on by Dr. Adams who was then State Plant Pathologist. Occasional scouting was conducted by state and federal men and some nursery sanitation work carried on through 1937. A program was carried on during 1938 and 1939 under WPA funds. A maximum of five men were employed with Mr. Bernard Rufahl in charge of the work. A total of 242 acres of white pine, mostly planted, with a control area of 6,186 acres was found. Cultivated, abandoned and escaped cultivated ribes destroyed totaled 6,889. In general, the planted white pine was found making excellent growth. Lumber production reports indicate up to 7 million board feet of white pine were cut per year from 1906 to 1909. Several instances were found where good white pine stands were resulting from the natural reproduction from very old ornamental trees. In some cases the rate of growth for this white pine equaled or exceeded that of other forest species. To date we have no report of white pine weevil being present in the state. No blister rust has been found on white pine although it was found in one or more locations in each county on cultivated ribes. No wild ribes were found and escaped cultivated ribes were noted in only one location.

During the summer of 1946 Mr. M. E. Michaelson was employed during which time newly established white pine plantations were checked and all former known ribes locations were examined. So few ribes were found coming back from previous working that it has not been considered necessary to do any intensive work since.

The planting of white pine has continued each year since. During 1949 over 38,000 were planted for reforestation purposes. Within the next few years and periodically thereafter it would be desirable if someone could be assigned for a few months to again check the newly established plantations and as many of the old ones as is desirable.

Georgia

Except for occasional scouting during earlier years, blister rust control work was started in Georgia in 1934. Over 500,000 acres in 11 northeastern counties were found supporting commercial quantities of white pine. The control area is about 675,000 acres. Wild ribes were found on only about 6,500 acres of this area. Large portions of this have been discontinued and there now remains only about 1,000 acres of known ribes control in the state.

Nearly 3,000,000 wild and cultivated ribes were destroyed while a continuous program was in effect from 1934 to 1946. A small amount of rework was performed during 1950 and present indications are that no additional ribes eradication will be necessary until about 1960.

Excellent stands of white pine are found in elevations ranging from 800 to 3,000 feet. Native white pine does not occur very much below this minimum elevation, nor are native white pines found very much farther south or west than where there are commercial quantities. Successful ornamental plantings have been made over a large portion of the state, the farthest south known is in Moultrie which is less than 100 miles from the Gulf of Mexico. At the higher elevations in the white pine counties this species has replaced much of the chestnut which was killed by the blight. Some of the fastest growing white pine over an extensive area is found here. Census reports indicate about 2½ million board feet of white pine lumber is cut annually.

Three species of ribes have been reported in Georgia; namely, curvatum, rotundifolium and cynosbati. Rotundifolium is the least abundant and is confined to the highest elevations. Neither rotundifolium nor cynosbati would be expected below 4,000 feet except in very favorable sites. The lowest reported are about 2,700 feet for these species. Curvatum was found very abundant on Fort Mountain at about 2,900 feet and a few were found in the same area as low as 1,900 feet. There was a heavy comeback of these species at 2,900 feet but very light at the lower elevations. The lowest elevation where curvatum has been observed in the state was on Stone Mountain at an elevation of about 1,000 feet. The heaviest concentrations of wild ribes were found on Grassy Mountain, Fort Mountain, Cocosa Bald and Slaughter Mountain. With the exception of curvatum, the comeback following eradication was very light compared to the more favorable ribes sites in the northern portion of the region. Unless there is a more rapid spread of the white pine into higher elevations only a small amount of work will be necessary to maintain the control of the disease in the state. Possibly a few hundred to a thousand dollars at intervals of 5 to 10 years will be adequate.

Blister rust was first found in Georgia in 1949. Infected ribes were found on the Vogel State Park in Union County. None has been found on pine and no other ribes infection has been found since. Since blister rust is well established in scattered white pine at high elevations along the North Carolina-Tennessee line we can expect it to appear on ribes and scattered white pine in similar situations in Georgia. There is no danger of commercial damage to the better white pine stands in the state so long as periodic checking and ribes eradication is conducted as outlined above. From a blister rust standpoint, white pine can be recommended for planting anywhere in Georgia below 1,000 feet in elevation and on at least 95% of the land under 3,500 feet.

Kentucky:

Blister rust control work was started in Kentucky in 1934. The work was discontinued in 1935 with very few ribes found and the white pine limited to about three or four counties on the Cumberland Mountain plateau in central Kentucky. A few weeks were spent in 1939 by J. Curtis Ball in further checking and scouting particularly on white pine plantations. During the fall of 1942 Henry E. Yost spent two weeks scouting for blister rust throughout the Cumberland range. A resurvey was conducted largely on the Cumberland National Forest in 1944. Present records indicate 48,000 acres of white pine with a control area of 146,000 acres, about 1/3 of which is on the Cumberland National Forest. Census reports for recent years show an annual cut of 2 million board feet of white pine lumber in the state.

Wild ribes were found on about 100 acres of this control area. Slightly over 5,000 bushes were destroyed. Intensive scouting was carried on during August and September of 1950 by Glenden E. Keaton. No blister rust has been found to date on either host plant. Some excellent stands of white pine were found within the purchase area of the Cumberland National Forest. They are confined largely to Morgan, Menefee and Wolfe Counties. Scattered white pine and smaller stands are found throughout the Cumberland Mountain range. Successful plantations have been found over most of the state. One outstanding plantation was observed at Morgan Springs in 1951. This plantation was established about 1938 and on the whole has made growth equal to any reported in the region. During the previous winter there was considerable damage in this area from heavy sleet storms but the white pine showed far less damage than other coniferous species. All plantations observed were successful with the possible exception of a few on disturbed areas following strip mining.

The wild ribes found in the Cumberland Mountains were all cynosbati and were believed to be confined to the better white pine counties. Heavy growth of cynosbati was found by Keaton in 1950 in Carter Cave State Park on relatively small areas. Fragmentary reports have been received of ribes also occurring in McCreary and Whitley Counties. During 1951 Henry E. Yost found what appeared to be a native area of R. missouriensis near Lexington in Fayette County. No extensive scouting was carried on but this definitely raises the question as to the extent to which this species may be distributed in the state. Efforts are being made to enlist the aid of state officials in scouting for these bushes in the course of their normal duties.

From a blister rust control standpoint white pine can be recommended for planting throughout the state. However, those in charge should be sufficiently familiar with ribes and their ecology to recognise favorable sites in the Cumberland Mountains. Others should also be familiar with R. missouriensis as well as the cultivated species. So far as is known cultivated ribes are seldom if ever grown in commercial quantities but observations indicate that small plantings are widely distributed throughout the state and occur at perhaps 1 to 5% of the homes in rural areas and villages.

Very little work will be required to maintain control of the disease in future years. Some education work and cooperation on the part of the State Forester, State Entomologist, Soil Conservation Service and other cooperating agencies will probably take care of the problem to a large extent. It may be necessary to occasionally employ a few men to do checking and ribes eradication work on the present control area.

Maryland

During 1951, 41,073 ribes were destroyed on 921 acres using 189 man-days. All of the work was on the Savage River State Forest in Garrett County. It was performed during the early spring season under the direction of District Supervisor Clarence Fultz of Lost River, West Virginia.

Scouting for blister rust was started in Maryland at least as early as 1917. The first rust was found by Detwiler, Hodgkin and Geiser in 1931. The first extensive eradication of wild ribes in the region was carried on in this state in 1922 by Karl E. Pfeiffer, Assistant State Forester. This work was carried on while planting white pine and other species at Rock Lodge in

Garrett County. At this time very little blister rust was known to be present outside the Northeastern Area. According to Mr. Pfeiffer it was questionable in the minds of some pathologists whether or not the disease could spread and do damage as far south as Maryland. However, as a precaution all bushes observed near white pine were destroyed. This area was next worked in 1934. Even after a lapse of 12 years the effectiveness of this eradication was very apparent. Although bushes were present throughout all the areas it was possible to determine very accurately the areas on which Pfeiffer's men performed eradication. The rust is believed to have become established in Maryland in 1924 in Garrett and Allegany Counties although it was not found on pine until 1935. Extensive control work was begun in the fall of 1933 and continued on practically a full-time basis until 1942. Since that time some work has been performed nearly every year on a seasonal basis. Due to a shortage of both funds and manpower, practically no work was carried on except on State Forests during the war years. Following the war a re-examination of privately owned white pine areas in Garrett County resulted in abandoning most of them. There was a marked reduction in white pine due to cutting, suppression, blister rust and fire. The loss from blister rust, except in this western county, has been negligable throughout the state.

Our survey indicates about 70,000 acres of white pine with a control area of 163,000 acres. Of this, over 30,000 acres have had wild ribes. Over 4 million bushes have been destroyed in the state. Most of the large acreages of white pine occur in Allegany and Washington Counties where it is found usually mixed with hardwoods or Virginia pine. Smaller areas with pine frequently dominant or co-dominant are found in Garrett, Frederick, Carroll and Baltimore Counties. Successful plantations are found in practically all counties within the state. Census reports for recent years indicate an annual cut of about 1/2 million board feet of white pine lumber.

The following species of wild ribes are found; rotundifolium, cynosbati, glandulosum. Glandulosum is found only in Garrett County at the higher elevations. The wild gooseberries are generally distributed throughout that part of the state west of Cumberland. Between Cumberland and Frederick they occur only on more favorable sites usually in patches. Escaped cultivated bushes have been found in several locations west of the Chesapeake Bay.

From a blister rust control standpoint white pine is recommended for planting throughout the state east of the Catoctin Mountain and in practically all areas east of Cumberland. It should not be planted west of Cumberland until a careful examination of the proposed planting site and the control area has been made for ribes.

Maintaining control of white pine in the future should not represent any major problem. A few hundred dollars per year with no work done many years should take care of it.

Most of the employees with the State Department of Forests and Parks are thoroughly familiar with blister rust and its control. With a small amount of work on the part of the Bureau, a large amount of effective control work can be performed by these state men incidental to their normal duties without any specific appropriation of funds for this purpose.

North Carolina

During 1951, 3,253 ribes were destroyed on 366 acres using 76 man-days labor. Most of this work was on state and private lands in Avery County. Although some work was also performed on the Pisgah and Nantahala National Forests as well as the Blue Ridge Parkway.

Except for scouting by Cope in 1930, very little blister rust work was carried on in the state until 1934. The program has operated almost full-time from that year through 1951. During some years, particularly since 1943, very little work was found necessary. Blister rust was first found on ribes in 1941 and on white pine in 1945. Later information indicates that it probably became established in Ashe County in 1935. In 1941 it apparently spread southward about half way across the state. The years 1948 and 1949 were favorable for the rust during which time it spread into Georgia. Damage to commercial stands has been nil. Survey has been practically completed on over 700,000 acres of white pine with a control area of over 1,600,000 acres. Wild ribes have been found on approximately 15,000 acres of this control area. Over 2,800,000 ribes have been destroyed. A large number of these were cultivated bushes. During 1935 to 1939 a very intensive cultivated ribes program was carried on. Few, if any, commercial ribes plantings were found but a fair percentage of the mountain homes had a small number of bushes.

White pine is found in 25 counties covering the mountainous areas and on the eastern slopes of the Blue Ridge extending into the Piedmont Region. Census reports for recent years indicate an annual cut of about 30 million Board feet of white pine lumber. Millions of white pine trees have been planted through the efforts of the State Forestry Department, Extension Service, TVA, Soil Conservation Service and others. The optimum range of white pine is from about 1,500 feet to 3,500 feet in elefation. Scattered white pine in small stands have been found up to about 5,200 feet. White pine grows in pure or dominant stands, in about half of these counties. It is reproducing rapidly especially since effective fire control has been established. The present trend toward improved timber management indicates an excellent future for production of white pine lumber in the state. White pine is widely used as ornamentals and around several of the mountain resort areas.

Ribes rotundifolium, cynosbati and glandulosum have been found. The first two are the principle ones found in association with white pine. These bushes are seldom found below 3,000 feet in elevation and heavy concentrations are rare below 3,500 to 4,000 feet. The comeback following eradication is generally light. A few instances of infections found at high elevations to date indicate the rust will probably develop much the same as in the northern climates. This is particularly true at elevations of around 5,000 feet. Above this level red spruce and Frazier fir are dominant and the climate compares favorably with that of the Great Lakes Area.

Survey is practically completed in these counties where wild ribes and white pine are known to be found in association. The ribes-bearing control area has been worked or examined from two to four times. Work in the future will consist of examining these areas, doing sufficient survey work to keep up with the spread of the pine and such eradication as is found necessary.

Considerable work remains to be done in completing the survey to determine the distribution of wild ribes above the level of white pine. This is desirable to provide information for foresters as a guide in their attempt to extend the range of white pine.

South Carolina

The control program was started in the state during 1934. Along with this an intensive effort was made to destroy cultivated ribes in the three white pine counties. The resurvey was made of most of the purchase area of the Sumter National Forest in 1946 - 1947. As of this date nearly 65,000 acres have been found in the state supporting appreciable white pine with a control area of 130,000 acres. Census reports for recent years indicate an annual cut of 3/4 million board feet of white pine lumber. Nearly 7,500 cultivated bushes have been destroyed. No wild ribes have been found in the state. White pine was found in three northwestern counties of the state. A few pure or dominant stands were found while most of it occurs mixed with short leaf or Virginia pine and hardwood types. While no wild ribes have been found in the state isolated concentrations have been found in nearby North Carolina. If they are present it is very likely that their distribution would be limited to small areas in the more favorable sites.

We do not anticipate the need for any future control work except occasional scouting for the rust, or if time permits, some scouting for wild ribes. The rate of growth and apparent quality of white pine compares favorably with that found elsewhere in the region. From a blister rust control standpoint it can be recommended for planting anywhere in the state.

Tennessee

During 1951, 22,374 ribes were destroyed on 909 acres with an expenditure of 257 man-days. Work was all performed on a cooperative program and most of it on the Bledsoe State Forest. Of this, 181 acres was initial work.

Blister rust control work was started in Tennessee in 1934. A small amount of scouting for pine, ribes and rust was carried on previously. The survey and initial eradication was practically completed by 1943. Since that time it has been carried on on a seasonal basis.

The survey indicates over 770,000 acres of white pine with a control area of over 1,600,000 acres. This pine is found in eleven counties along the eastern boundaries of the state and ten counties in the Cumberland Mountains. Part of it is included in the Cherokee National Forest, Great Smoky Mountains National Park and Bledsoe State Forest. Practically all of this is in the Tennessee River Drainage. Census reports for recent years indicate an annual cut of about 12⅛ million board feet of white pine lumber. Large planting programs have been carried on by the U. S. Forest Service and TVA for several years. Most of the white pine in eastern Tennessee is dominant or co-dominant, mixed with hardwoods and other conifers. In the Cumberland Mountains it appears in a more scattered pattern in association with hardwoods and some short leaf pine. There is excellent reproduction throughout the white pine range and fair timber management and fire control practices are being carried out in the eastern counties. There is little or

no management being carried out on private lands in the Cumberland Mountains. There has been marked improvement in fire control in recent years but there remains room for considerably more work along this line. While some white pine has been planted in the past there is opportunity for a greatly expanded program for many years.

Ribes rotundifolium, cynosbati, missouriensis, curvatum and glandulosum have been reported in the state. Glandulosum is found in association with white pine in only one county. Missouriensis is not widely distributed while curvatum is limited largely to the southern half of the Cumberland Mountains. Wild ribes have been found on about 30,000 of the 1,600,000 control acres. Nearly 6½ million ribes have been destroyed to date. The comeback from rotundifolium and cynosbati is fairly light while missouriensis and curvatum appear to be better adapted to this area. In the eastern counties ribes seldom occur below 2,500 feet and do not usually appear over large areas under 3,000 to 4,000 feet. In the Cumberland Mountains cynosbati and curvatum are found at less than 1,000 feet. Cultivated ribes are seldom grown commercially and they do not appear to be particularly popular for garden use in any part of the state. During recent years more missouriensis have been found and a more intensive study regarding the distribution and ecology of this species would be desirable.

Control is practically established and most of the control area is on maintenance. The work can be handled in the future on a seasonal basis with no work being required during some years. Some ribes survey remains to be completed.

From a blister rust standpoint white pine can be recommended for planting anywhere in the state except at the higher elevations along the eastern boundaries and on some of the canyons and bluffs of the Cumberland Mountains. So far as we know, no scouting for wild bushes would be necessary west of the Cumberlands or at the lower elevations along the Tennessee River and its major tributaries. Planting sites in the Cumberlands should be checked prior to planting white pine and those above 3,000 feet along the eastern boundaries should also be checked.

Virginia

During 1951, 326,308 ribes were destroyed on 26,920 acres with an expenditure of 5,537 man-days. About two-thirds of this work was on the George Washington National Forest with one-third on state and private land with a small amount on the Shenandoah National Park. About one-third of this acreage was initial working.

The first blister rust in the region was found by Dr. Spaulding in Clarke County, Virginia in 1911. This was on planted stock which was destroyed and no more rust apparently entered the state until about 1922 when it became established by natural spread along the western boundary of Rockingham County. Some scouting was done on the George Washington National Forest from 1928 to 1933 along with a small amount of eradication. During 1933 the work was greatly expanded through the use of CCC and other emergency funds. The program has remained in force full-time since that date and probably can not go on a seasonal basis for several more years. The rust is now found generally distributed throughout the white pine sections of the state. Very little damage has occurred in the established control areas, although severe killing has occurred in small white pine stands and scattered areas outside the control area.

Survey is approaching completion and indications are that there are about 773,000 acres of white pine with a control area of slightly over 2 million acres. Pine is found in 33 counties extending from the eastern slopes of the Blue Ridge range, westward to the West Virginia state line and the Clinch Mountain range in southwest Virginia. Very little pine is found in the Shenandoah and other valleys between the Blue Ridge and Appalachian ranges although successful plantations have been established in many locations. White pine is usually dominant or co-dominant in the southern-most counties bordering North Carolina and Tennessee. While it occurs in mixture with hardwoods and other conifers throughout most of the other counties, some native white pine occurs as far east in the state as Richmond. Census reports for recent years indicate an annual cut of about 20 million board feet of white pine lumber. Successful plantations have been established throughout most of the state except along the seaboard. A planting program is expanding along with the development and increased availability of planting machines. Most of this planting is on privately-owned lands. Land acquisition on the National Forests has almost ceased and most of the open areas previously acquired have already been planted. Some under-planting in the federal areas may be carried on by the Forest Service. A small amount of planting is sometimes carried on by the Park Service in landscaping the Blue Ridge Parkway but none is anticipated on the Shenandoah National Park.

Wild ribes are found in all but a few of the 33 white pine counties. In many cases, however, their occurrance is limited to the crests of the highest mountains and they are frequently above the valuable white pine. Wild ribes have been found on slightly over 300,000 acres of the 2 million control acres. Slightly over 1/2 of this is on Forest Service holdings, although the major problem remains on the Forest Service. Generally the private holdings are at the lower elevations where the ribes comeback is much lighter. A large part of the privately owned ribes-bearing lands are surrounded by or adjacent to Forest Service holdings and are, therefore, part of the Forest Service problem. In general, ribes regeneration is lighter in the southern half of the state but continued reworking will be necessary on much of that portion north of the James River. Rotundifolium, cynosbati, and glandulosum are the major ribes species reported. The latter occurs in association with white pine in only a few instances in the vicinity of White Top Mountain near the North Carolina line. Cultivated ribes are seldom grown commercially and occur at only a fairly small percentage of the homes.

Although 92% of the control area is on maintenance a considerable amount of work will be required for several years. At present labor costs it is estimated that an average of $25,000 per year will be required for the Forest Service and $15,000 to $20,000 per year for the cooperative program. The ribes distribution is fairly well known throughout the state except for some of the southwestern counties. Close cooperation is being developed with the State Forest Service in preventing white pine from being planted in association with heavy concentrations of wild ribes.

West Virginia

During 1951, 121,494 ribes were destroyed on 10,676 acres with an expenditure of 1,463 man-days. About 2/3 of this work was on the National Forests and 1/3 on state and privately owned lands. All of it was second of other working.

Blister rust work was started in West Virginia under CCC and other emergency programs in 1933. Considerable scouting had been carried on in the state at least as early as 1931. The work has been conducted onsa full-time basis and should continue so for several years. Due to a shortage of funds we have been unable to keep up with the necessary re-work schedule on non-federal lands. The outlook is now more favorable and it is hoped that survey can be completed as well as the necessary eradication work during the next biennium. The survey to date indicates 540,000 acres of white pine with a control area of nearly 850,000 acres. This is found in 12 eastern counties extending from the southern end of the state to the eastern pan-handle. The white pine is dominant to co-dominant in the four central counties and occurs in mixture and scattered in the northeast and southwestern ends of the control area. Census reports for recent years indicate an annual cut of about 4-3/4 million board feet of white pine lumber. Not much white pine has been planted in these counties due to the general distribution of ribes but a moderate planting program is being conducted in the remainder of the state. Considerable planting has been carried on in recent years in the Potomac Valley as a part of the flood control program. As in the other states, during the last 20 years we have had a marked increase in white pine reproduction along with effective fire control.

Wild ribes have been found on about 270,000 acres of the 850,000 acres control. Only about 15,000 acres of this ribes-bearing control area is on Forest Service land, leaving West Virginia the largest non-federal problem control acreage in the region. Ribes comeback following eradication is generally heavy for this region although perhaps less than that in many other parts of the country. A high degree of control can be established as was demonstrated on National Forest lands where adequate funds have been available. Some damage is being suffered on private holdings. Ribes rotundifolium and cynosbati are the only wild ribes found in association with white pine, although others are believed within the state. Rotundifolium is more prevalent in the northern counties with cynosbati being practically the only one found in the four or five southern counties. About 7-3/4 million ribes have been destroyed to date. A few wild ribes are known to be present in the northern pan-handle and in all probability they also occur in the central and western portions of the state. With our present limited knowledge we expect them to be widely scattered and growing only in most favorable sites. So far no funds have been available for an extensive ribes survey except in the immediate vicinity of white pine. With an expanded planting program developing such survey would be highly desirable.

Present estimates indicate that some $2,000 to $7,000 per year will be required to maintain control on the National Forests and up to $40,000 per year for the non-federal holdings. Expenditures during recent years have been about $10,000. The major needs during the next 5 - 10 years would be as follows:

1. Sufficient labor money to bring the record schedule up to date.

2. Complete the ribes survey for the entire state, as a guide for a planting program.

3. Complete the resurvey and the unsurveyed pine areas in Hardy and Hampshire Counties.

4. Continue an intensive educational program.

PART IV

BLISTER RUST CONTROL WORK ON NATIONAL FORESTS

Region 7

Introduction:

This section is intended to give a brief resume' of the work performed to date and the status of control. A more detailed work plan outlining future requirements is found in the section on pages 3 through 15. Statistical summaries are in the last section of the report.

Cumberland National Forest

Probably the first attention given to blister rust in the Cumberland National Forest was scouting in 1919. Records indicate no detailed work until 1934 when a survey was made and ribes destroyed where found necessary. General examinations and additional scouting was carried on periodically until a re-survey was made in 1944. Reports now show 16,980 acres supporting commercial quantities of white pine with a control area of 32,102 acres. Ribes were found on the forest in only one location, this being in Chimney Top Hollow near Pine Ridge. The few ribes that were found in 1944 were destroyed. A few weeks were spent scouting within and near the forest for rust on cultivated bushes in 1950 with negative results. Census figures indicate as much as 13 million board feet of white pine cut in Kentucky in 1907 and between one and three million board feet during the last decade. A major portion of this was no doubt being taken from the forest purchase area and nearby sections. Lumbering and uncontrolled burning during the first quarter of the century has reduced the white pine tremendously. Improved fire control has been largely responsible for heavy reproduction in some cases and proper timber management will bring much of this through to maturity. Commercial white pine is confined largely to two or three counties in the vicinity of Red River but scattered trees indicate that the entire purchase area of the forest is within the white pine botanical range. From a blister rust standpoint the growing of white pine should be encouraged at every opportunity.

Our present knowledge of ribes distribution is far from complete. Detail surveys were confined to areas supporting an appreciable quantity of white pine. In addition, however, wild ribes have been found in Carter County near Lexington. Relative abundance in the Cumberlands in nearby Tennessee indicate that they may occur throughout more of the purchase area. If present they would likely be found in only very specific sites; relatively small areas with possibly heavy concentrations. The only species reported thus far in the Cumberland Mountains in Kentucky was cynosbati. Cultivated ribes were found generally distributed although at a fairly small percentage of the homes.

The future requirements for maintaining control of the disease on this forest will be very light. Only a few days at intervals of five to ten years would be necessary to check the few known ribes locations in association with white pine. In view of the likelihood of bushes being present, it would be desirable that an intensive search be made throughout the purchase area if white pine is to be planted or favored in the timber management program. This

could be accomplished by assigning a man for two or three weeks during the spring of a few years or having regular Forest Service personnel do this work. The disadvantage of the later plan is that this is during the spring fire season when their duties would normally be heavy. It would also be desirable for the Forest Service personnel to examine wild and cultivated bushes when they have an opportunity to do so during the late summer and early fall to determine the presence or absence of infection.

From the blister rust standpoint white pine can be recommended for planting throughout the entire forest. It would appear to have definite possibilities in view of the gradually improving sites resulting from fire control.

George Washington National Forest

The survey was at last completed on this forest during 1951 and the only survey necessary in the future will be a small amount required to keep abreast of changing conditions. Ribes were removed from 14,757 acres during the year. Two hundred eighteen thousand bushes were destroyed on 16,000 acres with 3,716 man-days being used on the Forest Service projects. This difference in acreage represents the privately owned land adjacent to or surrounding national forest holdings where it was necessary to destroy the ribes in order to protect forest service pine. The work was conducted in Pendleton, Hardy, Rockingham, Augusta, Bath, Amherst and Nelson counties.

The first blister rust work on the forest consisted of scouting in 1917 or perhaps earlier. Additional scouting trips were made between then and the end of 1928 when a more detailed reconnaissance was made of the forest. Ribes eradication work was begun on a small scale in 1929 and continued until 1933. At this time the program was expanded through the use of CCC and other emergency funds. In 1942 with the close of these programs, the first regular Forest Service funds became available. All of the work since that time has been performed by the Bureau on a reimbursement basis or similar arrangement.

White pine is generally distributed throughout the purchase area of the forest. Records now indicate 191,000 acres of white pine with a control area of 418,000 acres. About 130,000 acres of this is ribes-bearing land. Approximately 5,000 acres remains unworked. In a few cases pure stands of white pine are found. Perhaps one-third of it could be classed as co-dominant or better. On the remainder of the white pine acreage it occurs mixed with hardwoods, principally. A large percentage consists of young white pine being overtopped by hardwoods. During recent years much has been done to release such white pine through timber cutting. In other cases the overstory consists of chestnut oak or other species of such poor form or quality that it has no market value. Work and plans are underway for considerable encouragement of white pine on the sale area betterment program. White pine is usually the highest priced species in timber sales and its presence is frequently the difference between the profitable sale and no sale at all.

Wild ribes are found on about one-third of the control area but this ribes-bearing land is so distributed that it represents a threat to a larger portion of the white pine. Bushes are usually absent below 2,000 feet. They are seldom found on the warm slopes up to 3,500 feet. They are generally heavier on the cool slopes and may occur on about all sites above 3,500 feet. Most of the secondary valleys run east and west which gives us a ribes distribution following a fingering pattern penetrating most of the white pine areas. Ribes comeback following eradication is generally light to medium below 3,000 feet and practically nil under medium to dense shade at any elevation. This factor has been an important one in timber marking operations. The predominant ribes species is rotundifolium. Some cynosbati is present especially at the lower elevations. The heaviest ribes producing areas are on the Dry River and Deerfield Ranger Districts. The distribution on the Warm Springs District is rather widespread but ribes regeneration is relatively light.

As of the end of 1951 there remain about 5,000 unworked acres and 83% of the control area is on maintenance. It is hoped to complete this initial work and to do the most pressing rework by June 30, 1952, and then suspend operations on the Virginia side of the George Washington for the fiscal year 1953. During this time the supervisors and perhaps a few skilled laborers can concentrate on the Jefferson National Forest, later returning to the George Washington. Practically no hourly employees will be worked during the winter months. An attempt will be made to do examinations of the eradication work as necessary during the spring months. The supervisors, using a few skilled hourly employees can do necessary checking during the summer months and a small amount of resurvey will be necessary during the winter. A work plan has been prepared which provides for continuing the work on approximately an eight-year rotation.

Jefferson National Forest

No work was conducted on the Jefferson during 1951.

Except for occasional scouting, the first control work on this forest was begun in 1933 with CCC labor. This was carried on continuously until about 1938. No further work was found necessary until 1943. From then until 1948 a resurvey was made where necessary and ribes eradication work performed. Present records indicate 55,000 acres of white pine within a control area of 107,000 acres. About 13,000 acres of this was ribes-bearing. Most of the white pine is found in the Wythe and Holston Ranger Districts. Wild ribes in association with white pine are found along Iron Mountain in these two districts. A few wild ribes were found in association with white pine in the Glenwood District. Practically no pine-ribes association is found on the New Castle District. No white pine is known to occur on the Clinch District and very little is known regarding ribes distribution. White pine is dominant or co-dominant on 1/3 to 1/2 of the pine producing acreage. Excellent reproduction is present, particularly on some parts of the Holston and Wythe Districts. Some excellent results were obtained in releasing white pine through TSI work during the CCC program. This is being continued insofar as possible through timber sales and sale area betterment work. White pine plantations established during CCC program have made excellent growth, although at the highest elevations some appear to be damaged from the weevil.

Rotundifolium and cynosbati are the only ribes generally found in association with white pine. Glandulosum is present within the forest on White Top Mountain and vicinity but with very few exceptions occurs well above the white pine. Ribes regeneration following eradication has been very light except at the higher elevations and in the absence of appreciable shade.

It is planned to rework the forest during the fiscal year 1953. Three supervisors and possibly a few skilled hourly employees will examine and check the ribes-bearing control area during the summer of 1952. Unless more work is found than is anticipated they can do the necessary eradication during the spring of 1953. It is not likely that any additional work will be required for eight to ten more years.

Monongahela National Forest

During 1951, 15,495 ribes were destroyed on 4,172 acres with an expenditure of 521 man-days. All of this was third working. Most of the work was conducted in Pocahontas County on White Sulphur Ranger District.

The first blister rust work on the Monongahela consisted of scouting for the disease in 1917. In 1928 eradication work was begun at the Forest Service Nursery at Parsons, West Virginia. This work was conducted nearly every year until 1950. During this time there was no evidence that any rust became established on the trees in the nursery. Ribes eradication was first begun on the forest in 1933 under the CCC program. It was conducted each year until 1946. No more work was found necessary until 1949. According to present plans no work will be necessary for about five years after 1953. At the end of the present year 92% of the control area is on maintenance.

According to the present survey 46,800 acres support white pine in a control area of 89,559 acres. Of this about 12,000 acres at one time supported ribes. Most of the white pine is found on the Greenbrier and White Sulpher Ranger Districts. A few plantations and the Parsons Nursery are located on the Cheat Ranger District. White pine could be classed as dominant or co-dominant on at least half of the pine acreage. Some of the largest and highest quality white pine in the state is found on the White Sulphur Ranger District, near Neola, West Virginia. Excellent reproduction has been noted since effective fire control was established about 25 years ago.

Ribes rotundifolium and cynosbati are found in association with white pine. The later species being the most abundant. Glandulosum is present at many places within the forest area but at elevations far above white pine. The ribes comeback following eradication is fairly light except in the absence of shade. Weather conditions appear generally favorable for the spread of the rust from ribes to pine and therefore the ribes population must be held to a lower level than is believed necessary in the southern parts of the region.

With most of the forest on maintenance and third workings nearly completed the future problem will consist of checking and eradication at intervals of 5 to 8 years. Some resurvey will probably be necessary and some initial eradication as well to keep up with the natural spread of the pine.

Region 8

Cherokee, Croatan, Nantahala, Pisgah & Sumter National Forests

The blister rust control problem on the National Forests in this region have enough in common that they can be discussed as one unit. Blister rust represents a definite hazard at the higher white pine elevation levels, particularly on the Cherokee, Pisgah and parts of the Nantahala National Forests. The same is true to a lesser extent on the Cherokees. These four forests have most of the white pine and in general have the best white pine in their respective states. From a blister rust standpoint white pine can be recommended for planting on 90-95% of the National Forest purchase areas throughout the region.

The white pine is of particular interest on the Bankhead National Forest. Approximately 100,000 seedlings were planted in cut-over areas during the last few years. These were confined to areas showing severe damage from little-leaf on the so-called hard pines. It is too early to determine the success of these plantings but, if the little-leaf disease continues and white pine develops as well as evidence to date indicates, it could very well become an important species on this forest as well as a major portion of Alabama and nearby Tennessee. A few hundred white pines were planted on the Bankhead about 15 years ago and have made excellent growth. One very old native white pine was found on the Forest and the reproduction from it appeared to be doing very well.

Wild ribes distribution is fairly well known throughout the commercial white pine range. Detailed information is available as a guide for planting white pine from the Bureau office in Asheville, North Carolina. R. glandulosum was found along the Tennessee-North Carolina line at elevations of 5,500 feet or more as far south as Clingmans Dome in the Great Smoky Mountains National Park. One exception to this is in Gentry Creek, Johnson County, Tennessee where this species occurs as low as 2,400 feet. R. rotundifolium and R. cynosbati occur along the same state line range and extending into Georgia but are seldom found below 3,000 feet and usually occur in only restricted areas below 4,000 feet. R. curvatum has been found in Georgia at elevations of about 2,500 feet and on the DeSoto State Park in Alabama at about 2,000 feet. They also occur in the Cumberland Mountains in Tennessee at about 1,000 feet. This species has been reported by botanists over a wide range including Georgia, Alabama and even Louisiana. R. missouriensis may also be a problem although it has been found only in the purchase area in the northern portion of the Cherokee. No wild ribes have been found in South Carolina. While R. curvatum, R. missouriensis or R. cynosbati may be present well below the present commercial white pine range it is not likely that they would represent any serious blister rust hazard. Their occurrence is almost certain to be widely scattered and in all likelihood climatic factors would generally be unfavorable for the spread of the rust from these bushes to white pine.

Blister rust has been found on white pine in several locations along the North Carolina-Tennessee line as far south as Haywood County, North Carolina. It has been found on ribes in the same area and extending into Union County, Georgia. No damage has occurred in any native forest stands under protection. This disease will be a relatively minor problem in the management of white pine in this region, and a small amount of work periodically should provide adequate protection in the future. A long-range work plan has been prepared for ribes eradication on these forests and is shown on pages 3 through 15 in this report. Statistics covering white pine, control area, status of work, etc., is shown in the section at the end of the report.

PART V

BLISTER RUST CONTROL IN NATIONAL PARKS

The reports on the National Parks are basically the same as the Forestry reports submitted by them to their Regional Office. The detailed statistics appear in the following section along with those for other ownerships in the Southern Appalachian States. Where one Park involves two states, separate statistics are given for each as requested by Mr. Shanklin of the Department of the Interior.

Work was conducted in much the same manner as in previous years. Work in the Shenandoah National Park was conducted by Mr. Fields Benton, blister rust checker, under the direction of Ranger J. W. Howell. The work in the Great Smoky Mountains National Park was conducted by Mr. Roy Whaley, blister rust checker, under the direction of Assistant Chief Ranger J. B. Light. Work in the Blue Ridge Parkway was conducted on a reimbursement basis by Mr. W. A. Stegall, Jr., field supervisor in Asheville, North Carolina.

Shenandoah National Park

As of the end of the year the status of the work in the Shenandoah National Park was as follows:

White pine in control area	3,080 acres
Control acreage in Park	14,270 acres
First working	14,270 acres
On maintenance	12,790 acres
Percent on maintenance	90%

Eradication work completed during 1951 was as follows:

Area No.	Working	Acres WP	Acres Control	Acres Worked (All Crew)	Ribes Destroyed	Man-Days
13	3/other	60	320	140	1,305	26
15	"	24	165	36	141	9
17	"	120	460	123	484	37
23	"	145	405	20	110	3
	Totals	349	1,350	318	2,040	75

Crews averaged 4.24 acres per man-day in 1951 compared with 2.1 acres per man-day in 1950. Ribes reproduction has been suppressed by an overstory of hardwoods in the above areas, and this condition plus the effective work previously done accounts for the considerable decrease in the number of plants per acre eradicated in 1951. Infection on ribes leaves was found only in Area 13 (Rocky Bar). Fewer trunk and branch cankers were found in comparison with previous years.

In addition to the eradication, post checking was performed as follows:

Area No.	Acres Post Checked	Man-Days
2	264.0	12
8	212.5	11
Totals	476.5	23

In addition to the post checking and eradication work, a large number of field reference markers and grid corner stakes were checked and, where necessary, a preservative was applied to the stakes. Permanent records were brought up to date and some work accomplished on the individual area maps.

Expenditures for the year were as follows:

	Expenditures	Man-Days
Salaries	$1,825.83	146
Wages	1,838.80	245
Other	1,113.13	
	$4,777.81	391

Work scheduled for 1952 will consist of ribes eradication in the spring of the year on about 190 acres in areas 2 and 8, and post checking 1,282 acres in areas 4, 14 and 42. In the course of post checking consideration will be given to the quality and quantity of white pine. During recent years several areas were discontinued because of the reduction in the amount of pine. In a few cases this reduction was due to blister rust damage but by far the greatest loss was due to weevil damage combined with suppression by other species.

Blue Ridge Parkway

The status of the BRC program in Blue Ridge Parkway as of the end of 1951 is as follows:

	Virginia	North Carolina	Total
White pine in control area	636 acres	5,143 acres	5,779 acres
Control acreage in Parkway	2,581 "	11,309 "	13,890 "
First working	2,581 "	11,309 "	13,890 "
On maintenance	1,545 "	10,061 "	11,606 "
Percent on maintenance	60%	89%	84%

The following is taken from the Blue Ridge Parkway report and describes the work performed during the current year:

During the period May 8 - 15, 1951 two men were employed on the Cone and Price Memorial Parks at Blowing Rock, North Carolina to complete the mop-up of cultivated ribes at several horesites, and to check and perform any necessary eradication in the control zone of the white pine plantation on the Johns River Road in the vicinity of the Price Park site. The following figures reflect the work as accomplished:

15 Acres re-eradicated
341 wild ribes destroyed
351 cultivated ribes destroyed
48 man-hours expended on eradication
36 man-hours expended on scouting and miscellaneous work.

Expenditures during the year amounted to $264.27. Wages and salaries amounted to $147.75 and the other expenses $116.52.

Work plans for next year have not been completed. It has been proposed, however, to make a complete review of the files and records and perhaps a field examination of some of the present control areas and possibly some parts of the Parkway where grading has been completed during recent years. The complete blister rust control problem of the Parkway can not be determined until the grading is finished. At present there remains approximately 30 miles in the vicinity of Roanoke and about an equal strip near Asheville on which we have only tentative locations. Between Asheville and the Great Smoky Mountains National Park there remain long sections on which no grading has been done. While this future work may result in some changes in the white pine acreage, we believe the figures shown herein will constitute at least 75% of the ultimate total.

Great Smoky Mountains National Park

The status of the BRC work in the Great Smoky Mountains National Park as of December 1951 is as follows:

	North Carolina	Tennessee	Total
White pine in control area	12,106 acres	55,799 acres	67,905 acres
Control acreage in Park	27,407 "	83,497 "	110,904 "
First working	27,407 "	83,497 "	110,904 "
On maintenance	21,358 "	83,497 "	104,855 "
Percent on maintenance	77%	100%	94%

Fontana addition (North Carolina). During 1951 a reconnaissance was made of about 30,000 acres and a 5% re-survey on 3,602 acres in the Fontana addition to the Park, requiring 4,000 man-hours and an expenditure of $5,953.00. Much of the survey was in remote areas which required considerable driving and in many cases much walking. All of the work was conducted from a camp. Wild ribes were found at lower elevations and closer to white pine than had been known or anticipated in this area. This increases the likelihood of there being an eradication problem in the Fontana addition.

The 1952 work program includes (1) completion of the planned resurvey in the Fontana addition and (2) post checking in the Cataloochee watershed in accordance with AP-14 records, if time permits.

PART VI

STATISTICAL SECTION

TABLE I

SUMMARY OF RESURVEY WORK IN THE REGION DURING 1951

State	Acres White Pine Surveyed	Acres White Pine Retained In Control Area	Control Area Covered On Survey	Man-Days Expended	Acres Covered Per Man-Day
North Carolina	7,098	7,082	24,925	92	271
Virginia	41,052	40,511	137,328	530	270
West Virginia	2,307	2,644	6,530	27	234
T O T A L	50,937	50,237	168,783	679	249

TABLE 3

SUMMARY OF RIBES ERADICATION BY STATES - 1951

State	Acres Worked				Ribes Destroyed	Man-Days on Eradication	Acres** Worked Per M.D.	Ribes Pulled Per Acre
	First Working	Second Working	Other Working	Total Working				
Maryland	-	737	184	921	41,073	189	4.9	44.6
North Carolina	50	32	284	366	5,268	76	4.8	8.9
Tennessee	181	-	728	909	22,374	257	3.5	24.6
Virginia*	79,210	11,091	6,328	96,629	326,308	5,537	4.0	12.1
West Virginia	-	3,295	7,381	10,676	121,494	1,463	7.2	11.3
T O T A L	79,441	15,155	14,905	109,501	514,502	7,522	5.2	22.0

* Includes 69,709 acres in Virginia on which no ribes were found.

** Ribes-bearing acres only.

TABLE 3

SUMMARY OF CHECKING WORK BY STATES - 1951

State	Post Checking*			Regular Checking**			Total		
	Strip Acres	Acres Covered	Man-Days	Strip Acres	Acres Covered	Man-Days	Strip Acres	Acres Covered	Man-Days
North Carolina	99	1,978	65	-	-	-	99	1,978	65
Tennessee	70	1,944	42	-	-	-	70	1,944	42
Virginia	241	4,816	98	696	13,918	204	937	18,734	302
West Virginia	545	15,530	124	157	3,132	42	702	18,662	166
T O T A L	955	24,268	329	853	17,050	246	1,808	41,318	575

* Sampling the areas for ribes some years following the last working to determine the need for re-working.

** Sampling the areas for ribes following work performed during current year or late previous season to determine the proficiency of the crews.

TABLE 4

SUMMARY OF EXPENDITURES FOR BLISTER RUST CONTROL WORK - 1951

BY STATES AND SOURCE OF FUNDS

State	Federal Funds					Cooperative Funds			Total
	Entomology and Plant Quarantine		Forest Service	Park Service	Total Federal Funds	Direct Aid	Indirect Aid	Total Dr. & Ind. Aid	All Funds
	Adm.	Coop.							
Maryland	$ 843.31	$ 516.29	$ -	$ -	$ 1,359.60	$ 995.35	$ 300.00	$1,295.35	$ 2,654.95
North Carolina	3,436.25	379.82	1,597.26	6,217.27	11,680.60	2,207.10	600.00	2,807.10	14,487.70
Tennessee	2,396.91	483.77	181.99	-	3,017.67	2,423.37	60.00	2,483.37	5,546.04
Virginia	23,613.16	2,876.15	48,487.35	4,777.81	79,754.47	12,273.00	700.00	12,973.00	92,727.47
West Virginia	12,711.14	676.89	13,683.53	-	27,071.56	3,926.05	50.00	3,976.05	31,047.61
TOTAL	$43,050.77	$4,932.92	$63,950.13	$10,995.08	$122,928.90	$21,824.87	$1,710.00	$23,534.87	$146,463.77

TABLE 2

SUMMARY OF RIBES ERADICATION WORK - 1951

BY PROJECTS

Project	First Working			Second Working		
	Acres*	Ribes	Man-Days	Acres	Ribes	Man-Days
Geo. Wash. Nat. For.	57,995	132,550	1,024	8,500	61,000	1,674
Monongahela Nat. For.	-	-	-	-	-	-
Sub-Tot. Reg. 7	57,995	132,550	1,024	8,500	61,000	1,674
Nantahala Nat. For.	-	-	-	7	727	4
Pisgah Nat. For.	-	60	2	25	167	3
Sub-Tot. Reg. 8	-	60	2	32	894	7
Sub-Total Forests	57,995	132,610	1,026	8,532	61,894	1,681
Shenandoah Nat. Park	-	-	-	-	-	-
Blue Ridge Pk"way (N.Carolina only)	-	333	4	-	10	1
Sub-Total Parks	-	333	4	-	10	1
TOTAL - FEDERAL	57,995	132,943	1,030	8,532	61,904	1,682
Maryland	-	-	-	737	15,641	132
North Carolina	50	249	10	-	-	-
Tennessee	181	5,196	32	-	-	-
Virginia	21,215	72,029	1,111	3,375	7,938	430
West Virginia	-	-	-	2,510	80,577	400
Sub-Total Coop.	21,446	78,474	1,153	6,623	104,156	962
T O T A L	79,441	211,417	2,183	15,155	166,060	2,644

* Includes 54,445 Ribes-free acreage on George Washington Nat. For.
15,264 Ribes-free acreage on Virginia-Cooperative.

(Continued)

TABLE 5

SUMMARY OF R.B.S. ERADICATION WORK - 1951

BY FIELDS

Other Workings			All Workings			For Acres **		Varieties Secured Per 100 Acres
Acres	Ribes	Man-Days	Acres	Ribes	Man Days	Ribes	Man-Days	
7,086	48,977	1,414	73,581	342,527	4,112	12.7	.21	98
4,172	15,495	521	4,172	15,495	521	3.7	.12	36
11,258	64,472	1,935	77,753	358,022	4,633	11.0	.20	82
-	-	-	7	727	4	103.8	.57	3
90	468	15	115	695	20	6.0	.17	4
90	468	15	122	1,422	24	11.6	.20	8
11,348	64,940	1,950	77,875	359,444	4,657	11.3	.20	101
318	2,040	75	318	2,040	75	6.4	.24	5
15	329	1	15	672	6	44.8	.40	4
333	2,369	76	333	2,712	81	8.1	.24	9
11,681	67,309	2,026	78,208	362,156	4,738	11.0	.20	111
184	25,452	67	921	41,073	189	44.5	.20	10
179	910	36	229	1,159	46	5.0	.20	6
728	16,178	285	909	22,374	257	24.6	.28	5
1,028	25,531	205	25,619	105,301	1,746	10.2	.17	47
1,105	1,932	146	3,615	82,439	546	22.8	.15	24
3,234	69,716	669	31,293	252,346	2,784	15.7	.17	92
14,905	137,025	2,695	109,501	514,502	7,522	12.9	.19	190

** Ribes-bearing acres only.

TABLE 6

SUMMARY OF ACRES WORKED ON RIBES ERADICATION - 1951

BY OWNERSHIP

OWNERSHIP	ACRES			
	First Working	Second Working	Other Working	Total Working
George Washington National Forest	11,541	6,702	5,113	23,356
Monongahela National Forest	-	-	2,931	2,931
Sub-Total, Region 7	11,541	6,702	8,044	26,287
Nantahala National Forest	-	7	-	7
Pisgah National Forest	-	25	90	115
Sub-Total, Region 8	-	32	90	122
SUB-TOTAL - FOREST SERVICE	11,541	6,734	8,134	26,409
Shenandoah National Park	-	-	318	318
Blue Ridge Parkway (North Carolina only)	-	-	15	15
SUB-TOTAL - PARK SERVICE	-	-	333	333
TOTAL - FEDERAL	11,541	6,734	8,467	26,742
Maryland	-	737	184	921
North Carolina	50	-	179	229
Tennessee	181	-	728	909
Virginia	67,669	4,869	1,673	74,211
West Virginia	-	2,815	3,674	6,489
TOTAL - STATE & PRIVATE	67,900	8,421	6,458	82,779
REGIONAL TOTALS	79,441	15,155	14,925	109,521

TABLE 7

SUMMARY OF RIBES ERADICATION WORK 1928-1951

BY PROJECTS

Project	First Working			Subsequent Working			All Workings		
	Acres	Ribes Destroyed	Man-Days	Acres	Ribes Destroyed	Man-Days	Acres	Ribes Destroyed	Man-Days
George Wash. Nat. For.	596,632	1,411,125	16,966	101,367	1,785,324	26,946	697,999	3,196,449	43,912
Jefferson Nat. For.	302,262	128,343	337	3,156	199,358	1,494	305,418	327,701	1,831
Monongahela Nat. For.	29,090	225,331	2,240	22,268	121,602	4,005	51,358	346,933	6,245
Cumberland Nat. For.	38,730	13	328	65	36	8	38,795	49	336
Sub-Tot. Region 7	966,714	1,764,812	19,871	126,856	2,106,320	32,453	1,093,570	3,871,132	52,324
Pisgah Nat. For.	50,937	52,147	1,016	2,022	12,144	325	52,959	64,291	1,341
Nantahala Nat. For.	20,434	-	45	7	727	4	20,441	727	49
Cherokee Nat. For.	541,393	1,966,590	11,138	24,588	30,547	673	565,981	1,997,137	11,811
Sumter Nat. For.	48,561	-	382	-	-	-	48,561	-	382
Chattahoochee Nat. For.	253,116	1	2,523	391	12,436	411	233,507	12,437	2,234
Sub-Tot. Region 8	894,441	2,018,738	15,104	27,008	55,854	1,413	921,449	2,074,592	16,517
SUB-TOTAL FOREST SER.	1,861,155	3,783,550	34,975	153,864	2,162,174	33,866	2,015,019	5,945,724	68,841
Shenandoah Nat. Park	19,392	1,254,387	11,861	17,560	639,906	10,331	36,952	1,894,293	22,192
Blue Ridge Parkway N.C.	5,138	940	15	119	1,392	24	8,257	2,332	39
Parkway Va.	2,581	17,702	458	856	3,637	192	3,437	21,339	650
Sub-Tot.	10,719	18,642	473	975	5,029	216	11,694	23,671	689
Great Smoky N.C.	21,966	94,682	1,034	739	5,303	296	22,704	99,985	1,330
Mts., N.Park Tenn.	6,319	572	387	-	3	16	6,319	575	403
Sub-Tot.	28,285	95,254	1,421	738	5,306	312	29,023	100,560	1,733
SUB-TOTAL PARK SER.	58,396	1,368,283	13,755	19,273	650,241	10,859	77,669	2,018,524	24,614
TOTAL - FEDERAL	1,919,551	5,151,833	48,730	173,137	2,812,415	44,725	2,092,688	7,964,248	93,455

TABLE 7 (Continued)

Project	First Working			Subsequent Working			All Workings		
	Acres	Ribes Destroyed	Man-Days	Acres	Ribes Destroyed	Man-Days	Acres	Ribes Destroyed	Man-Days
Delaware	6,186	6,889	288	-	-	-	6,186	6,889	288
Georgia	444,111	2,736,578	8,571	2,884	248,303	1,150	446,995	2,984,881	9,721
Kentucky	122,156	4,098	1,164	65	931	19	122,221	5,029	1,183
Maryland	176,488	2,195,394	12,957	67,452	936,544	10,119	243,940	4,131,938	23,076
North Carolina	1,620,550	2,295,184	42,334	10,593	353,924	11,997	1,631,143	2,649,108	54,331
South Carolina	82,309	7,487	1,845	-	-	-	82,309	7,487	1,845
Tennessee	1,150,866	3,941,524	30,609	63,353	492,476	6,676	1,214,019	4,434,000	37,285
Virginia	1,110,546	6,136,473	61,138	56,142	1,492,797	20,609	1,166,688	7,629,270	81,747
West Virginia	809,654	5,640,446	42,294	111,033	1,158,622	17,241	920,667	6,799,068	59,536
Sub-Total Cooperative	5,522,646	23,964,073	201,180	311,522	4,683,597	67,811	5,834,168	28,647,670	268,992
T O T A L REGION	7,442,197	29,115,906	249,910	484,659	7,496,012	112,536	7,926,856	36,611,918	362,446

TABLE II

STATUS OF BLISTER RUST CONTROL WORK AS OF DECEMBER 31, 1951 - BY OWNERSHIP

Ownership	Total Acres		Acres Worked			Acres Not Worked	On Maintenance	
	White Pine	Control	First Working	Second Working	Other Working		Acres	Per Cent
George Wash. Nat. Fore.	191,267	419,219	413,995	69,152	37,616	5,224	349,454	83
Jefferson Nat. Fore.	55,084	107,474	107,474	3,737	856	-	102,869	96
Monongahela Nat. Fore.	46,854	89,559	89,559	11,606	5,395	-	82,541	92
Cumberland Nat. Fore.	16,980	32,002	32,002	85	85	-	32,002	100
Sub-Total Region 7	310,185	648,254	643,030	84,560	43,932	5,224	566,866	87
Pisgah Nat. Fore.	92,697	161,752	161,752	2,943	1,780	-	158,535	98
Nantahala Nat. Fore.	42,138	62,709	62,709	-	-	-	62,702	99
Cherokee Nat. Fore.	250,378	484,572	484,572	2,103	41	-	481,266	99
Sumter Nat. Fore.	18,794	53,862	53,862	3,700	-	-	53,862	100
Chattahoochee Nat. Fore.	295,902	349,903	349,903	330	97	-	349,715	99
Sub-Total Region 8	699,909	1,112,798	1,112,798	9,076	1,918	-	1,106,078	99
SUB-TOTAL FOREST SERVICE	1,010,094	1,761,052	1,755,828	93,636	45,850	5,224	1,672,944	94
Shenandoah Nat. Park	3,080	14,270	14,270	5,012	4,111	-	12,790	90
Blue Ridge Parkway Va.	630	2,581	2,581	856	-	-	1,545	60
Blue Ridge Parkway N.C.	5,143	11,309	11,309	1,232	- 119	-	10,061	89
Blue Ridge Parkway Sub-Tot	5,773	13,890	13,890	2,087	119	-	11,606	84
Great Smoky Mts. Nat. Park N.C.	12,106	27,407	27,407	413	360	-	21,353	77
Great Smoky Mts. Nat. Park Tenn	55,799	83,497	83,497	-	-	-	83,497	100
Great Smoky Mts. Nat. Park Sub-Tot	67,905	110,904	110,904	413	360	-	104,855	94
SUB-TOTAL PARK SERVICE	76,758	139,064	139,064	7,512	4,590	-	129,351	93
Cherokee Indian Res.	22	445	445	-	-	-	445	100
SUB-TOTAL INTERIOR	76,780	139,509	139,509	7,512	4,590	-	129,696	93
T O T A L - FEDERAL	1,086,874	1,900,561	1,895,337	101,148	50,440	5,224	1,802,640	95

TABLE 3 (Continued)

Ownership	Total Acres		Acres Worked			Acres Not Worked	On Maintenance	
	White Pine	Control	First Working	Second Working	Other Working		Acres	Per-Cent
Delaware	242	6,186	6,186	-	-	-	6,186	100
Georgia	248,576	324,452	324,452	678	141	-	329,302	98
Kentucky	51,199	114,312	114,312	-	-	-	114,312	100
Maryland	70,550	183,590	183,590	16,433	27,378	-	152,227	83
North Carolina	581,619	1,331,532	1,361,532	6,621	2,495	-	1,358,878	99
South Carolina	45,298	77,008	77,008	35,935	-	-	77,008	100
Tennessee	464,530	1,075,545	1,075,545	15,827	4,175	-	1,056,988	98
Virginia	554,230	1,525,452	1,492,006	35,152	9,717	34,448	1,441,719	94
West Virginia	262,936	707,620	707,045	111,071	14,870	575	541,049	76
Sub-Total State & Priv.	2,209,310	5,356,697	5,321,676	211,727	58,876	35,021	5,077,454	95
T O T A L REGION	3,346,184	7,257,258	7,217,013	312,875	109,316	40,245	6,875,094	95

REPORT ON

WHITE PINE BLISTER RUST CONTROL

NORTH CENTRAL REGION

CALENDAR YEAR 1951

▼

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH ADMINISTRATION
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE

NORTH CENTRAL REGIONAL OFFICE
301 Metropolitan Building
MINNEAPOLIS 1, MINNESOTA

Report of

WHITE PINE BLISTER RUST CONTROL

NORTH CENTRAL REGION, 1951

by

Henry N. Putnam
Pathologist

and

John T. Kroebor
Pathologist

[illegible]

White Pine Being Protected: Natural: [illegible] Acres; Planted: 164,735 Acres; Total: 1,127,693 Acres. Estimated Commercial Value: [illegible]

Status of Control on December 31, 1951. (Net Acres)

Item	Forest Service (Acres)	Indian Service (Acres)	Nat. Park Service (Acres)	State and Private (Acres)	Total (Acres)	[illegible]
W.P. in Control Area	139,652	79,879	15	908,147	1,127,693	.
Total Control Area	301,084	135,140	120	3,144,330	3,580,674	[illegible]
Worked Initially	279,361	129,236	120	2,618,841	3,027,558	[illegible]
Worked Twice	152,086	75,742	-	914,467	1,142,295	[illegible]
Worked More Than Twice	68,429	40,428	-	171,875	280,732	[illegible]
On Maintenance	199,055	92,371	-	1,170,598	1,462,024	[illegible]
Needing Initial Work	21,723	5,904	-	525,489	553,116	[illegible]
Needing Rework	80,306	36,865	120	1,448,243	1,565,534	[illegible]

Local Control, All Agencies (Gross Acres)

Working	Acres White Pine Protected	Acres Worked	Ribes Destroyed	Man-Days Used	Per Acre: Ribes	Per Acre: [illegible]
		Calendar Year 1951				
Initial	19,509	55,102	487,126	4,166	8.8	[illegible]
Second	18,321	40,814	421,326	5,125	10.3	[illegible]
Third and Other	16,787	32,570	454,163	7,050	13.9	[illegible]
Total, 1951	54,917	128,486	1,362,615	16,341	10.6	[illegible]
		Cumulative, 1917 to 1951				
Initial	1,095,681	3,558,037	224,289,231	892,119	63.0	[illegible]
Second	427,531	1,142,295	28,898,811	209,496	25.3	[illegible]
Third and Other	126,251	280,732	6,925,516	65,484	24.7	[illegible]
Total, Cumulative	1,649,463	4,981,064	260,113,558	1,167,099	52.2	[illegible]

Blister Rust Infection, 1951: On pine initially in Cass County, Michigan. Cumulative: Known on pines and ribes in all seven states; on pine in 185 counties; on ribes [illegible] 390 counties of the 622 counties in the Region. Most severe in north.

Nursery Sanitation, 1951: Nurseries worked, one in Illinois; two in Michigan; [illegible] Wisconsin. Cumulative: Ribes-free zones being maintained around 42 of the [illegible] nurseries originally protected.

Canker Pruning, 1951: 5,401 cankers removed from 2,601 trees; 237 fatally infected trees removed. Cumulative: 110,684 trees saved by removing 216,604 cankers; [illegible] fatally infected trees removed.

Surveying and Checking, 1951: 59,086 acres control area initially surveyed; [illegible] acres re-surveyed and 16,479 acres retained; 81,838 acres post-checked and [illegible] acres retained; 96,908 acres given regular check and 96,754 acres, or 99.8 percent, found satisfactory.

Cultivated Black Currant Elimination, 1951: Only in Michigan, where State Nursery Inspectors destroyed 3,390 plants in 131 plantings previously found. Cumulative: 35,861 plantings with 298,363 plants found; 34,928 plantings with 292,[illegible] plants destroyed.

Control Area Permits, 1951: 465 applications received in 4 states: 365 approved; 50 rejected; 50 voluntarily cancelled.

ILLINOIS

White Pine Being Protected: Natural, 231 Acres; Planted, 1,806 Acres.
Total, 2,037 Acres. Estimated Value: $1,662,50)

Status of Control (Net Acres)

Item	Non-Federal Public (Acres)	Private (Acres)	Total (Acres)	Percent of Total
White Pine in Control Area	1,195	842	2,037	
Total Control Area	6,166	6,026	12,192	100.0
Worked Initially	5,972	4,725	10,697	87.7
Worked Twice	7,337	3,197	10,534	86.4
Worked More Than Twice	7,669	5,528	13,197*	
On Maintenance	1,218	399	1,617	13.3
Needing Initial Work	194	1,301	1,495	12.3
Needing Rework	4,754	4,326	9,080	74.5

* Some areas worked 4 times.

Local Control, All by Bureau-State (Gross Acres)

Working	Acres White Pine Protected	Acres Worked	Ribes Destroyed	Man-Days Used	Per Acre Ribes	Per Acre Cost
Calendar Year 1951						
Initial	94	235	7,095	21	30.4	[illegible]
Second	56	126	4,912	24	15.6	[illegible]
Third and Other	26	108	3,734	24	34.6	[illegible]
Total, 1951	176	469	15,741	69	33.5	[illegible]
Cumulative, 1932 to 1951						
Initial	3,454	20,386	1,513,920	3,905	74.3	[illegible]
Second	2,349	10,534	618,105	2,543	58.7	[illegible]
Third and Other	2,876	13,197	570,162	3,692	43.2	[illegible]
Total, Cumulative	8,679	44,117	2,702,187	10,140	61.3	[illegible]

Blister Rust Infection, 1951: No new counties on pines or ribes.
Cumulatively found in northern Illinois on pine in 7 counties; on ribes in 24 counties, out of 102 counties in state.

Nursery Sanitation, 1951: State Tree Nursery reworked. Sanitation zones being maintained around 4 white pine growing nurseries.

Surveying and Checking, 1951: 275 acres control area initially surveyed; 947 acres resurveyed of which 238 acres were retained; 1,407 acres post-checked, and 550 acres retained; 561 acres given regular check after ribes eradication and found satisfactory.

Cultivated Black Currant Elimination, 1951: None. Cumulative: 532 plantings, 4,171 plants found; 60 plantings, 761 plants destroyed.

Counties

White Pine Being Protected: Natural: 321 Acres; Planted: 9,922 Acres; Total: 10,243 Acres. Estimated Value: $8,000,000

Status of Control (Net Acres)

Item	Forest Service (Acres)	Non-Federal Public (Acres)	Private (Acres)	Total (Acres)	Percent of Total
W.P. in Control Area	18	3,169	7,058	10,245	-
Total Control Area	179	16,858	72,852	91,889	100.0
Worked Initially	179	17,971	60,582	78,732	85.7
Worked Twice	-	9,111	14,968	24,079	26.2
Worked More Than Twice	-	6,337	5,705	12,042	13.1
On Maintenance	179	14,407	46,918	61,504	66.9
Needing Initial Work	-	887	12,270	13,157	14.3
Needing Rework	-	3,564	13,664	17,228	18.7

Local Control, All by Bureau-State (Gross Acres)

Working	Acres White Pine Protected	Acres Worked	Ribes Destroyed	Man-Days Used	Ribes	Per Acre Man-Days
Calendar Year 1951 - None						
Cumulative, 1923 to 1950						
Initial	9,823	93,126	475,924	4,040	5.1	0.04
Second	4,496	24,079	103,627	1,121	4.3	0.05
Third and Other	1,707	12,042	35,463	356	2.9	0.03
Total, Cumulative	16,026	129,247	615,014	5,517	4.8	0.04

Blister Rust Infection, 1951: No new counties. Cumulative: On pine in 3 counties; on ribes in 53 counties of the 92 counties in the state.

Nursery Sanitation: None, 1951. Sanitation zones maintained around 2 of the 6 nurseries originally protected.

Canker Pruning, 1951: None. Cumulative: 11 cankers removed from 6 trees.

Surveying and Checking, 1951: None.

Cultivated Black Currant Elimination, 1951: None. Cumulative: 5 plantings, 20 plants found; 3 plantings, 15 plants destroyed.

White Pine Blister Rust Control: Overall: 717 Acres; Planned: 5,252 Acres; Total: 5,969 Acres. Estimated Value: $11,000,000 - chiefly on small holdings.

Status of Control (Net Acres)

Item	Indian Service (Acres)	Non-Federal: Public (Acres)	Private (Acres)	Total (Acres)	Federal
White Pine in Control Area	50	589	5,330	5,969	
Total Control Area	500	3,625	46,524	50,649	
Worked Initially	500	3,573	30,597	34,670	
Worked Twice	456	2,586	5,061	8,103	
Worked More Than Twice	150	1,476	514	2,140	
On Maintenance	-	58	18,826	18,884	
Needing Initial Work	-	52	15,927	15,979	
Needing Rework	500	3,515	11,771	15,786	

Local Control, All Agencies (Gross Acres)

Working	Acres White Pine Protected	Acres Worked	Ribes Destroyed	Man-Days Used	Per Acre: Ribes	Per Acre: Man-Days
Calendar Year 1951						
Initial	21	113	9,180	85	81.2	0.75
Second	106	567	28,524	203	50.3	0.36
Third and Other	64	346	10,322	91	29.8	0.26
Total, 1951	191	1,026	48,026	379	46.8	0.37
Cumulative, 1933 to 1951						
Initial	3,476	39,341	3,615,149	27,466	91.9	0.70
Second	1,214	8,103	743,721	5,534	91.8	0.68
Third and Other	616	2,140	158,449	1,545	74.0	0.72
Total, Cumulative	5,306	49,584	4,517,319	34,545	91.1	0.70

Blister Rust Infection, 1951: No new counties. Cumulative: On pines in 9 counties in northeast; on ribes in 56 of the 99 counties in the state.

Nursery Sanitation, 1951: None. Ribes-free zones maintained around 7 of the 9 nurseries originally protected.

Canker Pruning, 1951: 39 cankers removed from 32 trees; 14 infected trees destroyed. Cumulative: 1,990 cankers removed from 755 trees; 748 infected trees destroyed.

Surveying and Checking, 1951: 50 acres control area initially surveyed; 93 acres resurveyed, with increase of 41 acres; 610 acres post-checked, with increase of 57 acres; 1,026 acres checked after eradication, and all found satisfactory.

Cultivated Black Currant Elimination, 1951: None. Cumulative: 1,611 plantings, 7,331 plants found; 1,606 plantings, 7,310 plants destroyed.

Summary of White Pine Blister Rust Control | December 31, 1951

METHODS

White Pine Being Protected: Natural: 316,754 Acres; Planted: 79,890 Acres; Total: 396,644 Acres. Estimated Value: $251,300,000.

Status of Control (Net Acres)

Item	Nat.Park Service (Acres)	Forest Service (Acres)	Non-Fed. Public (Acres)	Private (Acres)	Total (Acres)	Percent of Total
W.P. in Control Area	15	62,908	123,478	210,245	396,644	
Total Control Area	120	165,955	302,304	722,532	1,190,911	
Worked Initially	120	165,420	281,843	632,065	1,079,448	
Worked Twice	-	71,399	133,313	255,651	460,363	
Worked More Than Twice	-	39,808	30,738	57,129	127,675	
On Maintenance	-	127,172	150,156	237,406	514,734	
Needing Initial Work	-	535	20,461	90,467	111,463	
Needing Rework	120	38,248	131,687	394,659	564,714	

Local Control, All Agencies (Gross Acres)

Working	Acres White Pine Protected	Acres Worked	Ribes Destroyed	Man-Days Used	Ribes per Acre	Percent
		Calendar Year 1951				
Initial	2,339	12,561	33,691	371	2.7	
Second	6,340	14,127	107,418	1,570	7.6	
Third and Other	9,617	20,565	124,201	2,145	6.0	
Total, 1951	18,296	47,253	265,310	4,086	5.6	
		Cumulative, 1918 to 1951				
Initial	443,293	1,353,492	65,519,142	231,365	48.4	
Second	173,600	460,363	8,375,267	57,295	18.2	
Third and Other	53,661	127,675	1,338,300	14,889	10.5	
Total, Cumulative	670,554	1,941,530	75,232,709	353,549	38.7	

Blister Rust Infection, 1951: On pine initially in Cass County. Cumulative: On pines in 53 counties; on ribes in all of the 83 counties in the state. Most severe in Upper Michigan.

Nursery Sanitation, 1951: North Muskegon and Newaygo S.C.S. Nurseries worked initially. Cumulative: Ribes-free zones being maintained around 9 of the 15 nurseries originally protected.

Canker Pruning, 1951: 4,812 cankers removed from 2,069 trees; 223 infected trees destroyed. Cumulative: 106,988 cankers removed from 43,760 trees; 580 infected trees destroyed.

Surveying and Checking, 1951: 12,501 acres control area initially surveyed; 1,615 acres resurveyed and 2,027 acres retained; 31,549 acres post-checked and 25,711 acres retained; 30,362 acres checked for ribes after eradication and all found satisfactory.

Cultivated Black Currant Elimination, 1951: 131 plantings with 3,390 plants found and destroyed. Cumulative: 15,013 plantings with 150,847 plants found; 14,982 plantings with 150,585 plants destroyed.

Control Area Permits, 1951: 143 applications received; 62 approved; 42 rejected; 39 voluntarily cancelled.

Summary of White Pine Blister Rust Control, December 31, 1951

MINNESOTA

White Pine Being Protected: Natural: 196,861 Acres; Planted: 12,729 Acres; Total: 209,590 Acres; Estimated Value: $60,000,000.

Item	Forest Service (Acres)	Indian Service (Acres)	Non-Fed Public (Acres)	Private (Acres)	Total (Acres)	[illegible]
W.P. in Control Area	32,343	21,996	55,165	95,817	[illegible]	[illegible]
Total Control Area	70,361	39,539	115,754	256,810	[illegible]	[illegible]
Worked Initially	50,598	32,105	76,175	207,189	[illegible]	[illegible]
Worked Twice	30,718	27,481	23,146	46,255	[illegible]	[illegible]
Worked More Than Twice	15,453	10,878	5,824	7,817	[illegible]	[illegible]
On Maintenance	15,597	24,513	24,548	16,355	[illegible]	[illegible]
Needing Initial Work	19,763	294	39,583	59,210	[illegible]	[illegible]
Needing Rework	17,074	7,638	51,528	171,154	[illegible]	[illegible]

Local Control, All Agencies (Gross Acres)

Working	Acres White Pine Protected	Acres Worked	Ribes Destroyed	Man-Days Used	[illegible]	[illegible]
Calendar Year 1951						
Initial	562	1,629	62,718	637	39.0	[illegible]
Second	1,887	2,335	139,573	1,600	67.3	[illegible]
Third and Other	1,744	2,350	215,526	1,885	90.3	[illegible]
Total, 1951	4,193	6,314	315,759	4,120	50.0	[illegible]
Cumulative, 1917 to 1951						
Initial	178,003	426,594	32,170,775	162,000	75.9	[illegible]
Second	66,626	127,802	8,510,116	47,975	66.6	[illegible]
Third and Other	28,071	43,062	2,764,832	29,132	64.2	[illegible]
Total, Cumulative	272,500	597,458	43,445,723	239,031	122.9	[illegible]

Blister Rust Infection, 1951: No new counties. Cumulative: On pines in [illegible] on ribes in 33 of the 87 counties in the state. [illegible] prevalent in all [illegible] counties, especially severe in northeastern Minnesota.

Nursery Sanitation, 1951: None. Cumulative: [illegible] of the 17 nurseries originally protected.

Canker Pruning, 1951: 550 cankers removed from 520 trees. Cumulative: [illegible] cankers removed from 40,542 trees; 5,432 infected trees destroyed.

Surveying and Checking, 1951: 2,669 acres control area initially surveyed; 39,690 acres resurveyed, chiefly on Superior National Forest, and [illegible] remained; 8,290 acres post-checked and 7,419 acres remained; 5,163 acres [illegible] for ribes after eradication and all but 67 acres found satisfactory.

Cultivated Black Currant Elimination, 1951: None. Cumulative: 3,009 [illegible] with 23,300 plants found, and all destroyed.

Control Area Permits, 1951: 79 applications received; 71 approved; [illegible] rejected; 5 voluntarily cancelled.

Utah

White Pine Being Protected: Natural: 3,158 Acres; Planted: 18,887 Acres;
Total: 22,045 Acres. Estimated Value: $13,150,000.

Status of Control (Net Acres)

Item	Forest Service (Acres)	Non-Federal Public (Acres)	Non-Federal Private (Acres)	Total (Acres)	Per Cent of Total
White Pine in Control Area	515	8,761	12,769	22,045	-
Total Control Area	4,029	54,531	155,296	213,856	100.0
Worked Initially	4,029	43,100	131,532	178,661	83.5
Worked Twice	-	20,338	32,709	53,047	24.8
Worked More Than Twice	-	5,628	11,588	17,216	8.1
On Maintenance	4,029	16,982	68,916	89,927	42.1
Needing Initial Work	-	11,431	23,764	35,195	16.5
Needing Rework	-	26,118	62,616	88,734	41.5

Local Control, All Bureau-State (Gross Acres)

Working	Acres White Pine Protected	Acres Worked	Ribes Destroyed	Man-Days Used	Per Acre: Ribes	Per Acre: Man-Days
Calendar Year 1951						
Initial	158	670	5,757	43	8.6	0.06
Second	149	707	2,522	29	3.6	0.04
Third and Other	517	1,072	9,868	76	9.2	0.07
Total, 1951	824	2,449	18,147	148	7.4	0.06
Cumulative, 1933 to 1951						
Initial	17,326	212,102	2,580,425	33,081	12.2	0.16
Second	6,649	53,047	726,895	12,475	13.7	0.24
Third and Other	4,041	17,216	183,654	2,526	10.7	0.15
Total, Cumulative	28,016	282,365	3,490,972	48,082	12.4	0.17

Blister Rust Infection, 1951: No new counties. Cumulative: On pines in 10 counties on ribes in 65 counties of the 68 counties in the state.

Nursery Sanitation, 1951: None. Cumulative: Ribes-free zones maintained around 7 of the 16 nurseries originally protected.

Canker Pruning, 1951: None. Cumulative: 126 cankers removed from 44 trees; 1 infected trees destroyed.

Surveying and Checking, 1951: 1,246 acres control area initially surveyed; 691 acres resurveyed and 434 acres retained; 2,359 acres post-checked and 1,052 acres retained; 1,987 acres given regular check after eradication and all but 37 acres found satisfactory.

Cultivated Black Current Elimination, 1951: None. Cumulative: 3,830 plantings; 75,605 plants found; 8,405 plantings, 73,117 plants destroyed.

Control Area Permits, 1951: 24 applications received; 13 approved; 6 rejected; 5 voluntarily cancelled.

Wisconsin

White Pine Being Protected: Natural: 445,510 Acres; Planted: 36,627 Acres; Total: 482,137 Acres. Estimated Value: $172,753,000.

Status of Control (Net Acres)

Item	Forest Service (Acres)	Indian Service (Acres)	Non-Fed. Public (Acres)	Private (Acres)	Total (Acres)	%
W.P. in Control Area	31,968	57,849	125,732	184,595	482,137	-
Total Control Area	60,560	102,201	353,105	1,009,933	1,527,799	100
Worked Initially	59,135	96,591	350,739	772,477	1,278,942	84
Worked Twice	49,969	47,803	99,915	260,680	458,367	30
Worked More than Twice	13,168	20,400	15,813	16,019	65,400	4
On Maintenance	34,148	67,858	181,790	372,511	656,307	43
Needing Initial Work	1,425	5,610	2,366	237,456	246,857	16
Needing Rework	24,987	28,733	168,941	399,966	622,627	41

Local Control, All Agencies (Gross Acres)

Working	Acres White Pine Protected	Acres Worked	Ribes Destroyed	Man-Days Used	Miles	%
		Calender Year 1951				
Initial	16,635	40,494	368,605	3,009	9.1	-
Second	9,783	22,152	138,437	1,695	6.2	-
Third and Other	4,799	8,129	192,510	2,827	23.7	-
Total, 1951	31,217	70,775	699,552	7,531	9.9	0.1
		Cumulative, 1917 to 1951				
Initial	440,306	1,412,996	38,413,896	373,262	62.6	-
Second	172,597	458,367	9,821,082	82,551	21.4	-
Third and Other	34,479	65,400	1,874,656	20,374	28.7	-
Total, Cumulative	647,182	1,936,763	100,109,634	876,187	31.7	0.1

Blister Rust Infection, 1951: No new counties. Cumulative: Pine in 68 counties; on ribes in all 71 counties.

Nursery Sanitation, 1951: McKay (Home), McKay (No. 7) and Nepco (White Nurseries) worked. Cumulative: Ribes-free zones maintained around 9 nurseries producing about 20 million white pines out of 19 originally protected.

Canker Pruning, 1951: None. Cumulative: 26,399 cankers removed from 19,575 trees; 4,211 infected trees destroyed.

Surveying and Checking, 1951: 42,345 acres control area initially surveyed; 14,[illegible] acres resurveyed and 7,701 acres retained; 37,680 acres post-checked and [illegible] acres retained; 56,722 acres checked for ribes after ribes eradication and found satisfactory.

Cultivated Black Currant Elimination, 1951: None. Cumulative: 6,601 plantings with 37,080 plants found; 6,597 plantings with 37,051 plants destroyed.

Control Area Permits, 1951: 199 applications received; 198 approved; none rejected; 1 voluntarily cancelled.

Blister Rust Control Motion Pictures Shown, 1951: "Paul Bunyan Had a Scr[illegible] shown 223 times to about 22,160 persons.

ORGANIZATION CHART, NORTH CENTRAL REGION, AS OF DECEMBER 31, 1951

REGION V OFFICE - MINNEAPOLIS, MINNESOTA

HARRY L. SMITH - DIRECTOR

BLISTER RUST CONTROL PROJECT OFFICE
MINNEAPOLIS, MINNESOTA

PROJECT LEADER - HENRY M. PUTNAM
ASSISTANT PROJECT LEADER - JOHN K. KROEBER
SECRETARY - MAE V. NILSEN

ILLINOIS
DWIGHT

CONTROL SUPERVISOR - (A)
E. D. BERGDOLL

INDIANA
INDIANAPOLIS

CONTROL SUPERVISOR -
VACANCY

IOWA
DELWEIN

CONTROL SUPERVISOR -
R. G. HAYES

OHIO
COLUMBUS

CONTROL SUPERVISOR -
W. B. BECKER

MICHIGAN
TRAVERSE CITY

AREA LEADER -
L. E. NELSON

CLERK-STENOGRAPHER -
LOUIS PERLINSKI - (A)

UPPER MICHIGAN
ESCANABA

DISTRICT LEADER -
S. M. SAGER

FIELD SUPERVISOR -
A. J. VERVILLE - (A)

LOWER MICHIGAN
NEWAYGO

DISTRICT LEADER -
R. I. THOMPSON

FIELD SUPERVISOR -
VACANCY

MINNESOTA
ST. PAUL

AREA LEADER -
L. B. RITTER

CLERK-STENOGRAPHER -
VACANCY

EASTERN DISTRICT
DULUTH

DISTRICT LEADER -
R. W. NELSON

FIELD SUPERVISOR -
VACANCY

WESTERN DISTRICT
WALKER

DISTRICT LEADER -
J. M. LICHE

FIELD SUPERVISOR -
VACANCY

WISCONSIN
MADISON

AREA LEADER -
T. E. [illegible]
VACANCY

FIELD SUPERVISOR -
H. F. WILLIAMS - (A)

EASTERN DISTRICT
ANTIGO

DISTRICT LEADER -
RAY WOOD

FIELD SUPERVISOR -
G. O. NILS - (A)

WESTERN DISTRICT
CABLE

DISTRICT LEADER -
A. M. [illegible]

FIELD SUPERVISOR -
VACANCY

(A) - Cooperator or State Agent

Foreword

The comparative brevity of this report in contrast to Blister Rust Control Annual Reports of past years will please some and leave others with a desire for more detailed information. Additional information may be found in the individual reports of States, National Forests or Indian Reservations. This report is written to give the over-all Regional picture and still go into sufficient detail by states and ownership classes to satisfy most needs. It is so arranged that separates covering control work on National Forests and Indian Reservations will be available to those agencies. The summaries at the beginning of this report will give a bird's-eye view of the status of work by states and for the region as a whole. The tables in the back are primarily for reference purposes.

Four kinds of federal funds are allotted to the Blister Rust Control Project in the North Central Region. They are:

(1) BLR-1-3. Leadership, Coordination and Technical Direction.

(2) BLR-3-3. Cooperative Blister Rust Control on State and Privately owned Lands.

(3) BLR-4. Blister Rust Control Operations on National Forests.

(4) BLR-7. Blister Rust Control Operations on Indian Reservations.

The narrative section, charts and tables in the forepart of this report treat the project as one integrated effort embracing all activities. Separate sections for work on National Forests and Indian Reservations follow.

The accomplishment in 1951 compares very favorably with that of the previous year. Though Bureau reorganization affected the structure of the BRC organization, it had no material effect on field work which proceeded without interruption.

Organization

The accompanying chart shows the personnel which makes up the BRC organization of the Region and the distribution of the stations. The Calendar Year 1951 embraced a more than average number of changes in our regular personnel both as to status and location. In chronological order they were as follows:

At the end of January, Mr. Eugene F. Van Arsdel, cooperative State employee in charge of BRC work in Indiana, resigned to take advanced work under Dr. Riker at the University of Wisconsin. His place in Indiana remained vacant.

The BEC Office at Chester, Ohio, was moved back to Columbus, Ohio, by December 31, in line with consolidation of Bureau offices. The Gypsy Moth, Barberry and Japanese Beetle Offices will be together in Columbus, Ohio.

The Area Leader's Office at St. Paul, Minnesota, is being moved to Duluth. Area Leader Ritter and District Leader Nelson will occupy the same room.

There was considerable reorganization within the Bureau. For administrative purposes, its activities throughout the country were consolidated into five regions with a Director in charge of each. The North Central States, of which our BEC Project is a geographical unit, are included in Region V with headquarters at Minneapolis, Minnesota.

Leadership, coordination and technical direction of field work is provided by the Project Office at Minneapolis through Area Leaders in each of the three Lake States and through Field Supervisors or State Agents in Ohio, Indiana, Illinois and Iowa.

Fiscal and administrative matters are handled by the Regional Office.

Labor Conditions

Labor for eradication crews in 1951 was largely made up of local people who commuted to and from the work areas. Both men and women were used. In Michigan a considerable amount of work was done by prisoners from near-by honor camps. College forestry students were employed for work on the Superior National Forest, while local Indians protected pine on the Indian Reservations. Many of the smaller areas were protected by the owners themselves under the guidance of BEC technical personnel.

Labor was harder to get than a year ago but still proved adequate for the funds available.

Wage Board rates were slightly higher than the previous year with an average of 10 cents per hour increase - labor starting at 95¢ per hour.

The total man months of employment in 1951 was 1,114 as compared with 1,394 the previous year.

Authorization and Sources of Funds

As in the past, the work in 1951 was continued under Memorandums of Agreement drawn up between the responsible State Agencies and the Bureau of Entomology and Plant Quarantine.

During 1951, work was performed with funds furnished from the following sources:

1. State and Private

   a. Direct aid (Ribes eradication, supplemented by the Federal)
   b. Indirect aid (Other Services)

2. Federal Blister Rust Appropriation

   a. W-a Leadership, Coordination, and Technical Direction
   b. W-c Cooperative blister rust control on State and Private lands. (Matched by State direct aid)
   c. 74 Blister Rust Control on National Forests
   d. 77 Blister Rust Control on Indian Reservations

Spread of the Rust

Rust on ribes was not reported initially from any county in the Region in 1951. Pine infection was found for the first time in only one county, namely, Cass County, Michigan. Infection on ribes this year was about normal, heavy in the north, light in the south. The cool, wet weather that prevailed in late summer and fall may be reflected in an increasing amount of pine infection in unprotected areas that will show up in two or three years.

White Pine

There are 1,127,693 acres of white pine in the current blister rust control problem of the Region estimated to have a present and future stumpage value in excess of 425 million dollars. In addition to its monetary value, white pine has a high but intangible aesthetic and protection value. Distribution of this pine by states and ownership classes is given in the summary sheets in the forepart of this report. Roughly 20 percent of this pine is in Federal ownership, 28 percent in State and County, and 52 percent in private ownership.

Surveys

To maintain a current inventory of white pine, surveys are made by field personnel when not occupied with supervising control operations. Over eighty-five thousand acres of pine were surveyed in 1951. Of this amount 29,901 acres was new pine, the result of natural reproduction from old seed trees and plantings. It was necessary to drop 27,850 acres from the control problem because of logging, fire and disease. In general, the acreage of white pine in the Region is increasing as more second growth reaches seed-bearing age, more is planted, and more is protected from blister rust. Better management, adequate fire protection and a sounder appreciation of white pine values, will greatly reduce the need for discarding pine from the control inventory of the future.

This year the largest gain in pine acreage was in Wisconsin where 20,000 acres of natural pine was added, and the largest loss was on the Superior National Forest, where about 20,000 acres of white pine were taken out of the control problem, chiefly because blister rust losses had reduced values so much it would not be economical to do control work.

Local Control

In spite of the changes in organization and reduction in permanent personnel already described, the Local control accomplishment in 1951 compares favorably with that done the year before.

A total of 54,917 acres of pine was given protection by the destruction of 1,362,615 ribes on 128,486 acres of control area at an expenditure of [illegible] man days. See Tables 2 and 3.

Two developments enhanced this accomplishment; (1) the continued and expanded use of prison labor in Michigan and Wisconsin and (2) the complete handling by the Bureau of control work on all National Forests with the exception of the Superior. Bureau personnel selected, trained and supervised local control labor paid from Forest Service SEC funds. Another factor is the increased use of plant killing chemicals wherever practicable.

The same high standards of work were maintained. The Bureau assumes responsibility for the adequacy of control. All worked areas were given at least a two percent check to make sure that the prescribed standard of not over 25 feet of live stem per acre remained after eradication.

Of 96,908 acres worked and checked 92.3 percent contained less than 25 after eradication, 0.8 percent had between 15 and 25 P.S., and only one tenth of one percent exceeded the allowable maximum of over 25 P.S. per acre. An additional 31,578 acres was found to be ribes-free or nearly so, so required no formal [illegible].

A more detailed account of the checking record by States and ownership classes may be seen in Table 4 of this report.

The work done in 1951 increased the control acreage now on maintenance and requiring no further area work by 72,712 acres.

Status of Control

The ultimate goal of blister rust control is to reduce the ribes population on the 3,580,674 acres of control area to a point where no serious commercial damage will result to the pine. To date, after some 20 years of operation, practically 85 percent has been worked one or more times and 41 percent is on maintenance. The problem remaining is to rework 1,565,000 acres and initially work 553,000 acres. In addition, newly established areas will have to be given protection as natural white pine regeneration and planting progresses.

Tables 6 and 7 of this report show in detail the status of control by districts, states, and ownership classes. The status by counties may be ascertained from the individual State Reports.

Best progress in accomplishing control has been made on publicly owned lands, especially federal. The big problem remaining is to give protection to privately owned white pine. On public lands 92.5 percent of the white pine has been initially worked and 53.7 percent is on maintenance. In contrast, 62.2 percent of privately owned white pine has been given initial protection and only 33.5 percent is on maintenance. The big problem is protection of privately owned pine which makes up 52 percent of valuable white pine stands in the Region.

CHART 2

Status of Control by Ownership Classes

ALL STATES — NORTH CENTRAL REGION

Inception to December 31, 1951
(Based on Table 7)

Legend:

- Acres Needing Initial Work
- Acres Needing Rework
- Acres On Maintenance

ACRES IN CONTROL AREA

3,600,000
3,200,000
2,800,000
2,400,000
2,000,000
1,600,000
1,200,000
800,000
400,000
0

135,140 Acres
301,084 Acres
854,348 Acres
2,289,982 Acres

Indian Service
Forest Service
Non-Federal Public
Private
All Ownerships

Of the total 8,116,650 acres of initial and recent roadside white pine acres or 71 percent, involve privately-owned white pine. Regardless of ownership, these young stands are a potential natural resource of value to the nation as a whole. As such the protection is largely a public responsibility. At present, every effort is being made by the Bureau to give protection to the privately-owned pine through a program of information, demonstration and technical assistance. While progress is being made in getting more owners to actively participate in the protection of their pine, the control accomplishment is not keeping ahead of the disease on private lands. The accompanying Chart 2, shows the Status of Control by ownership classes.

Nursery Sanitation

Six nurseries were given sanitation workings in 1951, one State owned, two County S.C.S. and three private. Labor was provided by the nurseries and totalled 65 man days.

Ribes-free zones are being maintained around 44 nurseries in the Region. To insure the production of disease-free white pine planting stock the sanitation zones are checked at least every other year and worked as needed. At the present time, all of the white pine producing nurseries, except a few private ones, have been protected and the problem involves chiefly the maintenance of sanitary conditions. Ribes-free conditions must prevail around a nursery before certificates shipping permits are granted for the intra-state and interstate movement of white pines. Table 9 summarizes the nursery sanitation work done in 1951.

Control Area Permits

As defined in Federal Quarantine 63, the States of Michigan, Minnesota, Ohio and Wisconsin, are White Pine Control Area States. The movement of ribes into designated control areas within these states can only be done if each ribes shipment carries a control area permit issued by the proper State Plant Quarantine Officer. The issuing of control area permits is a function of the State.

As noted in Table 5, during 1951, of 465 applications for ribes shipping permits, 78.5 percent were approved. Of the 100 applications not approved, 50 were rejected by State authority because of danger to white pines and 50 were voluntarily withdrawn by the applicants.

Cultivated Black Currant Elimination

This phase of the control program is finished with the exception of an occasional recheck of certain counties and the elimination of a few bushes that for various reasons were not destroyed at the time they were found. Only Michigan carried on this type of activity in 1951. In the course of their regular work, Michigan Bureau of Plant Industry inspectors visited known locations of Cultivated Black Currants, mainly in southeastern Michigan. They found that owners had voluntarily removed 2,725 bushes from 44 locations. The inspectors removed 665 bushes from 37 other locations. Table 10 summarizes Cultivated Black Currant Elimination work performed in 1951 and cumulatively.

Canker Pruning

A small amount of canker pruning in protected areas was done in Michigan, Minnesota and Iowa in 1951. (See Table 12). Only valuable crop trees, or trees of high aesthetic value were treated. In Michigan, state prisoners did the work under Bureau supervision after the ribes eradication season. The work in Minnesota and Iowa was incidental to other blister rust control activities.

Chemical Eradication of Ribes

The Bureau is striving constantly to find ways and means of destroying ribes more effectively and economically. While uprooting these bushes by hand is still the chief means of destroying them, chemical eradication is playing an increasingly important role. Practically all wild black currants that are eliminated from control zones are now treated with 2,4-D. Other ribes species that are not as easily killed with kerosene-type sprays are treated with 2,4,5-T in the forepart of the growing season when they are most susceptible. More recently, basal stem treatment of ribes, using higher concentrations of 2,4,5-T in oil has been expanded into the dormant season. In areas where this method of ribes eradication is practicable the actual control operations can be extended over a ten or twelve month period instead of being limited to the growing season.

Informational Activities

The policy of the Bureau for getting blister rust control work done is based on a program of information, demonstration and technical assistance. The function of the BEC organization is telling people that there is such a disease as blister rust, showing how it can be controlled, and lending technical assistance by appraising individual protection problems, by training men to do the work, giving general supervision to the work, and checking results for adequacy of control measures.

It is a service organization, set up to help public agencies and private individuals to protect a natural resource of national concern. Federal land is worked with federal funds, state and private lands are protected cooperatively with the Bureau supplying the technical assistance and part of the labor, and the pine owners furnishing labor or funds for hiring labor on at least a 50-50 basis. With only very limited Federal matching funds available, it falls on the pine owner to supply most of the labor. The informational program is directed toward that end; helping the pine owner to help himself. This is being accomplished through short statements about blister rust control in newspapers, on radio, addresses to interested groups, exhibits and motion pictures. A very effective means of getting the message to white pine planters is the inclusion of a brief statement in price lists or planting instructions sent out by white pine producing nurseries.

Funds

The control program in 1951 was financed by several funds, federal, state, other public, and private.

Bureau W-e (SLR-3) funds were used for leadership, coordination and technical direction for control work on lands of all ownerships.

Bureau W-e (SLR-3-3) funds were used directly in the field for on-the-ground supervision and some labor, for work on State and private lands.

The Federal Forest Service (SLR-4) funds which were used by the Bureau to protect white pine on National Forests were spent chiefly for labor, direct supervision, and transportation.

Federal Indian Service (SLR-7) funds were used almost exclusively for the employment of Indians on Reservations. In addition, the Menominee Tribe contributed a substantial amount toward the employment of its people for rings eradicating on the Menominee Indian Reservation.

The several states provided cash allotments as well as labor and facilities for work on non-federal lands. Counties, municipalities, corporations and private pine owners also provided cash or labor for control work on their lands. Together, the states and other non-federal cooperators contributed cash and services exceeding Bureau (W-e) matching funds at the rate of 2½ to 1.

Outlook for 1952

It now appears that we can expect the accomplishment for 1952 to be equal to or greater than 1951. Federal and State funds allotted for Fiscal Year 1952 were on hand and will be used at the same proportionate rate in the first half of the Calendar Year 1952 as they were in the last half of 1951. Cooperative funds pledged by States, counties, municipalities, corporations and private pine owners for use in 1952 at least equal those provided in 1951. The labor situation is expected to be the same as this year, i.e., labor obtainable to the extent of funds available. Extension of the eradication period, into the dormant season through the use of the basal stem treatment of ribes, should result in more pine protected.

BLISTER RUST CONTROL ON NATIONAL FORESTS

NORTH CENTRAL REGION, 1951

Objective

The objective of blister rust control is to establish and maintain protection against this disease around all workable white pine stands and forest nurseries administered by the Forest Service. This involves initial and subsequent eradication of ribes bushes within infecting distances of white pine stands to bring such stands to commercial maturity free from appreciable blister rust damage.

Memorandum of Understanding

Under a Memorandum of Understanding, the Forest Service is responsible for selection of white pine areas to be protected, and for payment of labor and supervision to do the necessary control work. Beginning in the spring of 1951, on all forests except the Superior, the Bureau is responsible for hiring, payrolling and supervising all labor doing ribes eradication. The Bureau pays these men and is later reimbursed from Forest Service funds through 1080 procedure. The Bureau is also responsible for preparing work plans and maps, training labor and supervision, checking on adequacy of work, keeping records, and making necessary reports.

On the Superior National Forest, the Forest Service operated a camp and employed labor direct. However, there was close cooperation between the Forest Service and the Bureau in the training and supervision of labor.

General Status of Control

As may be seen in Text Table 2, there are nearly 140,000 acres of white pine listed for protection in the 301,000 acres of control area in this Region. This is a reduction of 34,000 acres of white pine and 53,600 acres of control area shown at the end of 1950. This reduction was made chiefly on the Superior. Thrown out of the control problem were white pine areas already largely destroyed by the rust, small areas with many ribes, areas not owned by the Forest Service, all pine stands in the Wilderness and No-Cut portions of the Forest, etc. For all of the eleven Forests listed, 92.6 percent of the white pine has been initially worked, and 50.4 percent of it is on maintenance. There is practically no control problem on the Wayne and Hoosier Forests. There are very few ribes. Blister rust control is fairly well on schedule on all of the Forests in the Region except the Superior. Initial control has been completed, or nearly so, on all Forests except the Superior, Chippewa and Chequamegon. Over 90 percent of the initial work remains to be done on the two Forests in Minnesota. A considerable amount of rework is necessary on the Forests in Minnesota, Wisconsin, and Upper Michigan.

Current Work, 1951

In Text Table 1, local control work done in 1951 by Forests is shown. About twice the acreage was covered in 1951 (28,351 acres) as was worked in 1950 (14,291 acres). More acreage was covered in 1951 than in 1950 on all of the Forests in Minnesota, Wisconsin, and Upper Michigan. In particular on the Hiawatha National Forest, 13,620 acres were worked in 1951, compared with 4,155 acres in 1950.

Effective work was done in 1951, compering favorably with that of 1950, as shown following:

Comparison of Control Work on National Forests in 1950 and 1951 All Workings

Year	Acres Worked	Ribes Destroyed	Man-Days Used	Per Acre Ribes	Per Acre Man Days
1950	14,291	393,740	4,674	27.5	0.32
1951	28,351	430,348	7,028	15.2	0.25

There was an average of 4 acres worked per man day in 1951 compared with 3 acres in 1950. However, the average number of ribes per acre destroyed in 1950 was nearly double that of 1951.

Checking for ribes after eradication in 1951 showed that a good job of ribes destruction was performed on all Forests. The regional average, based on a 2 percent check of nearly 27,000 acres, was 1.4 bushes with 3.1 feet of live stem per acre left after eradication. This is well below the acceptable maximum of 25 feet of live stem per acre.

Forest Service Costs, 1951

For the first time in this Region the scheme was tried out of having the Bureau hire, payroll and directly supervise men doing control work on National Forests. In 1951, this was done on all forests except the Superior. On this Forest, because of camp operations and work on other projects, the Forest Service hired and payrolled the men, with the Bureau working closely in giving training, technical supervision, checking, etc. The new scheme worked successfully. For the first three quarters of the Fiscal Year 1952, Bureau K-O funds were used to do work on Forest Service lands. Later, through 1080 procedure, the Bureau was reimbursed from Forest Service Blister Rust Control Funds. In the fourth quarter of Fiscal Year 1951, remaining Forest Service funds were transferred to the Bureau as a Working Fund.

As shown in Text Table 4, a total of $85,487.22 of Forest Service funds were spent on blister rust control. No Bureau funds are included in this statement. Charging all of these costs to ribes eradication gives us an overall average of $3.02 per acre worked, and $12.16 per effective man day as

regional averages. However, only $42,953.50 of the $65,967.26 was spent on ribes eradication, the remaining $23,013.76 was spent on pine surveys and other field data chiefly on the Superior National Forest. For actual ribes eradication costs only, there was an average of $2.20 per acre worked and $0.87 per man-day.

Status of Control by Forests

A resume' of the status of control on each National Forest follows. More detailed accounts are in the individual reports for each Forest.

Shawnee, Hoosier and Wayne National Forests

No blister rust control has been done or needed in the past for ye[illegible]. Ribes are absent or scarce. All white pine is planted and is now on maintenance. Due to long growing seasons and ample moisture, white pine growth is excellent. Leader growths of 4 feet annually are common. White pine yields of 50 M board feet per acre from plantations at 50 years of age have been reported from these southern states.

Lower Michigan National Forest

Huron Unit

No work was done in 1951, and the status remains practically as at the end of 1950, with 2,478 acres of white pine, four-fifths of which is planted, in the control problem. Nearly all has been initially worked, and 67.4 percent is on maintenance.

No local control has been set up for 1952. Plans call for an examination for ribes of all newly established white pine plantations; any new natural stands showing on aerial surveys; and a post-check of 6 areas previously worked.

Manistee Unit

As a result of land exchanges between the State and Forest Service, nearly 400 acres of white pine and 700 acres of control area were added to the control problem, bringing it to 24,422 acres of white pine, and 75,080 acres of control area. Over 21,000 acres of white pine are planted, chiefly under scrub oak. Ribes are generally scarce, and we are ahead of the control problem with 99.3 percent of the pine initially worked and 94.5 percent on maintenance.

No Forest Service funds were spent on blister rust control in 1951. The Bureau District Leader removed a few ribes from 3 areas with 455 acres of control area. See Text Table 1.

Plans for Calendar Year 1952 include the following recommendations:

1. Rework sanitation zone around Chittenden Nursery, using nursery funds.

2. Do initial and rework of areas surveyed in 1951, involving the working of nearly 2,900 acres to protect 1,243 acres of pine at an estimated cost of 91 man days.

Upper Michigan National Forest

Marquette Unit

No work has been done on this Forest since 1949. The status of needful remains practically the same. All of the 11,627 acres of white pine that have given initial work and nearly half of it is on maintenance. Ribes abundance varies from very light on sandy soils to heavy in the limestone rock portions.

Work recommended for Calendar Year 1952 is confined to the Rock Ranger District, where rework is planned for 12 areas, with 1,530 acres of white pine and 4,295 acres of control area. It is estimated that 747 man days are required.

Hiawatha Unit

As a result of post-check surveys, the total acreage of white pine in the control problem was reduced by over 800 acres. Discarded acreages included some plantation failures and natural pine areas not now measuring up to standards. All of the 12,776 acres of valuable white pine has been initially worked and two-thirds of it is on maintenance. Effective work in 1951 resulted in placing 2,150 acres of white pine in 6,500 acres of control area on maintenance.

Control work in 1951 was done on all three ranger districts. On the Rapid River District a crew of four women, already proven tree planters, did effective ribes eradication. A crew of high school boys was used on the Munising Ranger District. Some weeding out of personnel was necessary before a good crew was obtained. High water conditions in some portions prevented completion of planned work. On the Manistique Ranger District a crew of 17 to 18 men under Raymond Lancour, Forestry Aide, did very effective work. This crew completed not only work scheduled for 1951, but also that for 1952. Of the 15 areas worked, 15 were put on maintenance after working.

All of the areas worked in 1951 were systematically checked for ribes after eradication and found to be satisfactory in all cases.

A total of $8,852.76 of Forest Service funds was spent on local control in 1951 (See Text Table 4.) These funds were spent by the bureau in employment of laborers as described earlier. This represents an average man-day cost of $8.65 on the basis of 1,024 man-days used. The average cost per acre worked was 0.08 man-days, or $0.65.

The only work scheduled for 1952 is an incompleted job on the Munising Ranger District, where it is planned to work 410 acres to protect 200 acres of natural pine at an estimated cost of 60 man-days.

Ottawa National Forest

Acreage of white pine in the control problem has not greatly changed in recent years. While natural white pine continues to come in in some openings, the generally heavy soils of the Ottawa favor more tolerant types, such as hardwoods, crowding out young white pine. Ribes are generally abundant and widespread. An over-all average of nearly 90 bushes per acre of control area has been destroyed. This rate is exceeded only by the Superior with an average of 105 bushes per acre.

Damage from blister rust is not as serious on the Ottawa as [illegible] would indicate. This is due to the early and sustained control program accomplished. Rust is generally prevalent and there are fairly [illegible] cankers originated prior to ribes eradication. There are few new cankers in protected stands.

At the present time all of the valuable white pine owned by the Forest Service has been initially worked and 50 percent of it is on maintenance. By contrast, non-federal white pine stands within gross boundaries are in much worse shape. Of these stands, only 68 percent has been initially worked and 10 percent is on maintenance. Damage in unprotected lands is heavy and is increasing rapidly each year. Insufficient funds for work on these alienated lands is the reason for this bad situation.

Local control (entirely rework) was performed in 1951 on two Districts, Kenton and Iron River. A crew of women, several of whom had had previous ribes eradication experience, did effective work and completed assignments on the Kenton Ranger District. Men were used on the Iron River crew, under experienced crew leaders.

Checking for ribes after eradication showed that effective work was done. All areas completed showed less than the maximum of 25 feet of live stem allowable.

Costs of the work are shown in Text Table 4. All work was done after July 1. On the basis of $6,933.43 spent, and 800 man-days used, the cost per man-day was $8.65, the same as on the Upper Michigan National Forest. The cost per acre worked was 0.21 man-days, or $1.81. The cost per acre was higher on the Ottawa than on the Upper Michigan, because on the Ottawa ribes destroyed per acre were about double those on the Upper Michigan.

More work is planned for 1952 than was done in 1951. It is recommended that to protect 1,464 acres of white pine, 3,155 acres will be reworked, at an estimated cost of 1,177 man-days. This work is planned on all 5 ranger districts with the heaviest program on the Iron River Ranger District. All of the areas listed were worked last in the years 1944 to 1947.

Superior National Forest

Blister rust control on the Superior National Forest continues to be a challenge. Not only are pine areas the most inaccessible in this Region, possibly in the United States, but a combination of cool, moist summers, abundance of ribes, a high rate of rust intensification, and costly ribes eradication work makes it doubly important that only the most valuable white pine stands are protected.

The intensive reappraisal of white pine stands started in 1949, was virtually completed in 1951. Besides the usual data on white pines and ribes conditions, information on other timber species present was taken, in order to evaluate stands if white pine was eliminated by blister rust.

In determining the present reduced acreage in the Superior control problem, all white pine areas in the Roadless and No-Cut portions of the Forest, and all alienated lands were excluded. The existing problem of 28,673 acres of white pine and 43,680 acres of control area (Text Table 2) is considerably less than half of the 64,159 acres of white pine and 98,056 acres of control area

limited at the end of 1950. This does not mean that acreages remaining are all good stands of white pine. It does mean that funds and labor available are not adequate to protect all desirable stands before they are lost to the rust and that, therefore, it is realistic to devote available energy to the protection of the very best stands owned by the Forest Service, which will continue to be managed for white pine production.

As noted in Text Table 2, there still remains a great deal of control work on the Superior, even after the drastic reduction in acreage already described. Only 75.0 percent of the 28,673 acres of white pine has been initially worked and 45.1 percent is on maintenance. Practically three quarters of all initial work remaining on National Forests is on the Superior. Before none of the work remaining can be done, it is inevitable that pine values will be lost to the rust and such acreages discarded from the control problem.

In 1951 work on Forest Service funds was confined to pine survey already mentioned and to local control. Survey work started in April with a two-man crew. This was increased about June 15 to five two-man crews and a leader working to the end of August. During September and October one two-man crew continued on survey work. During the winter one man analyzed the data for the purpose of drawing up a reduced program. Survey work starting in 1949 was practically completed in 1951.

Local control was done on three districts: Gunflint, Halfway and Aurora. On the Gunflint, work was done out of the Gunflint Camp. Work on the other two districts was performed by commuting crews working out of Ely and Aurora.

As seen in Text Table 1, local control, mostly rework, was done on 2,365 acres at a cost of over one man day per acre worked. The difficult and costly nature of the work on the Superior is indicated from Text Table 1. On nearly the smallest acreage worked, the largest number of ribes was removed. Nearly twice as many man days as on any other forest were employed. For all forests there was an average of 15.2 bushes per acre destroyed, at a cost of 0.35 man-days per acre. On the Superior these averages were 49.8 bushes and 1.05 man-days respectively.

Systematic checking after ribes eradication showed that satisfactory ribes eradication had been done on all areas.

During 1951 Forest Service funds were spent for blister rust control on the Superior National Forest, as shown following:

Local Control: $24,097.19; Surveys: $21,693.85; Total: $45,791.04

For local control alone, based on 2,569 man-days used, this represents a man-day cost of $9.38 or a per acre worked cost of $10.20. Funds for local control were spent by the Forest Service, with the usual close cooperation of Bureau personnel.

Plans for future workings are in the making. These are based on concentrating work during a given year in a certain district or contiguous districts, thereby reducing travel time and facilitating field supervision. A long time plan will be based on completely working the forest, covering each of the districts at a five year interval. Preliminary plans call for working in the Halfway District out of Ely in 1952.

Chippewa National Forest

Through surveys there was an increase in 1951 of 467 acres of white pine, and 229 acres of control area in the control problem on the Chippewa over what was present at the end of 1950. There are now 13,510 acres of white pine and 26,681 acres of control area in the control problem. Of this white pine 81.7 percent has been initially worked and 62.9 percent is on maintenance.

Local control in 1951 was predominantly rework. Of the 3,004 acres worked, only 215 acres were covered initially. Work was done on 24 areas in three Ranger Districts: Walker, Bena and Cass Lake. Ribes at the rate of 37 per acre were destroyed at an expenditure of 0.13 man-days per acre.

Checking for ribes after eradication showed that satisfactory work had been done on all areas. There was an average of 1.4 bushes with 3.0 feet of live stem left after working. This is well below the allowable rate of 25 feet of live stem per acre. All but 62 acres of the 3,004 acres worked fell in the 0 to 15 feet of live stem class after working.

Forest Service funds spent in 1951 for blister rust control totalled $10,091.50. Of this, $8,761.23 was spent on ribes eradication and $1,330.27 on surveys. The cost per man-day for ribes eradication alone was $6.71, and the cost per acre worked was $2.92.

Long time work plans have been developed for the orderly covering of the Forest by districts once every five years. Thus approximately one-fifth of the acreage will be worked each year. When pine areas all reach a state of maintenance the yearly blister rust control work needed will be greatly reduced. On the Chippewa, the sensible plan is followed of making post-checks of areas coming up for rework the year before eradication work is planned. Sufficiently accurate maps and plans are thus provided. During May and June, 1952, plans are set up for working 728 acres requiring an estimated 368 man-days of labor, costing $3,575. For the full Fiscal Year 1953, besides a considerable amount of post-check work, plans call for working 685 acres using an estimated 272 man-days. This will require an estimated $4,945 for Fiscal Year 1953.

Chequamegon National Forest

White pine continues to come in on this Forest through natural reproduction. Through surveys in 1951 nearly 1,000 acres of new white pine areas involving about 1,300 acres of control area were added to the total acreage listed for protection. There are now 22,000 acres of white pine with 37,184 acres of control area listed. Approximately 96.4 percent of the pine has been initially worked, and 53.1 percent of it is on maintenance. While these percentages are about the same as at the end of 1950, they represent the addition of 919 acres of white pine initially worked, and 847 acres placed on maintenance in 1951. Although there are a few good stands of white pine on all of the five ranger districts, approximately four-fifths of the white pine is on the Washburn Ranger District.

Local control in 1951 started the latter part of May and continued to September 18. Initial work only was done on the Glidden and Hayward Districts where 1,166 acres were worked to protect 898 acres of pine, using 849 man-days. Ribes averaged about 70 per acre, causing slow work. Rework was done on the Washburn District where 1,703 acres were worked to protect 1,089 acres of white pine using 470 man-days. Experienced men for crew leaders and labor are available in Cable and near-by towns.

was done on all areas.

Forest Service expenditures for blister rust control totalled $10,671.00 for the calendar year. For the 1,319 man-days used on ribes eradication, this represents an average man-day cost of $8.20. The cost per acre worked was $1.50.

Plans for work are prepared a year in advance. Areas selected are then examined jointly by the District Leader and the Forest Service management men. The approved areas are then listed in the plan. For May and June 1952, it is proposed to do initial work on the Hayward and Glidden Ranger Districts on 286 acres of control area to protect 158 acres of white pine, using an estimated 280 man-days of labor, costing $2,632. Work planned for Fiscal Year 1953 calls for continuation of initial working on the same two ranger districts and re-work on the Washburn Ranger District. The total program for Fiscal Year 1953 requires the working of 38.89 acres to protect 2,775 acres of white pine, using 1,815 man-days and costing $13,970.

Nicolet National Forest

The control problem at the end of 1951, 11,969 acres of white pine, divided about equally between planted and natural, and 23,376 acres of control area, is virtually the same as at the end of 1950. Most of this pine is in the Eagle River and Lakewood Districts, with smaller amounts on the Argonne and Florence Ranger Districts. At the end of 1951 all of the white pine had been initially worked and practically half of it is on maintenance.

All work scheduled for 1951 was confined to the Lakewood Ranger District and was completed during the period May 24 to June 30. Two crews, each composed of six men and a crew leader, both under the direction of an experienced foreman were used. Practically all of these men had had previous ribes eradication experience. Earlier in the spring they were engaged in tree planting by the Forest Service. As usual, their work in ribes eradication was very satisfactory. During 1951 (see Text Table 1) 2,000 acres were worked to protect 874 acres of white pine, using 312 man-days.

Cost of this work (Text Table 3) was $2,997.46. This was all spent in the last quarter of Fiscal Year 1951, except for $155.00 for spring in July, 1951. On the basis of 312 man-days spent on ribes eradication, the average cost per man-day was $9.61. Average cost per acre for 2,000 acres worked was $1.50.

In the 1950 report of work on the Nicolet (Table 4) there is a proposed work schedule showing by fiscal years work necessary in each ranger district to place on maintenance all known pine areas by 1957. This plan, of course, is subject to modifications due to unforeseen deletions or additions of pine areas. For May and June, 1952, the revised plan calls for 440 man-days to work 1,580 acres. Approximately $3,848 of Forest Service funds is available for this purpose. For the Fiscal Year 1953, it is planned to work approximately 2,000 acres using an estimated 565 man-days costing $5,200 on the basis of existing wage rates.

Text Table 9. Status of Control on National Forests, North Central Region, on December 31, [illegible]

National Forest	Acres in Total Control Problem: White Pine	Acres in Total Control Problem: Control Area	Acres Initially Worked: White Pine	Acres Initially Worked: Control Area	[illegible] on Maintenance: White Pine	[illegible] on Maintenance: Control Area	Acres Control Area Needing Work: Initial	Acres Control Area Needing Work: Rework	Percent [illegible] White Pine: Initially Worked	Percent [illegible] White Pine: [illegible]
Hoosier, Indiana	18	179	18	179	18	179	0	0	100.0	[illegible]
Wayne, Ohio	515	4,029	515	4,029	515	4,029	0	0	100.0	[illegible]
Huron, Mich.	2,493	7,671	2,475	7,641	1,683	5,806	30	1,755	99.4	[illegible]
Manistee, Mich.	24,492	75,080	24,240	74,575	23,090	70,500	505	3,075	99.3	[illegible]
Hiawatha, Mich.	12,776	35,061	12,776	35,061	8,549	15,491	0	9,570	100.0	[illegible]
Marquette, Mich.	11,627	25,570	11,627	25,570	5,647	13,395	0	12,175	100.0	[illegible]
Ottawa, Mich.	11,590	22,573	11,590	22,573	5,021	10,900	0	11,671	100.0	[illegible]
Superior, Minn.	28,673	43,680	21,769	28,079	17,922	17,654	15,601	10,425	76.0	[illegible]
Chippewa, Minn.	13,570	26,681	11,090	22,519	8,531	15,873	4,162	6,686	81.7	[illegible]
Chequamegon, Wis.	21,999	37,184	21,233	35,759	11,678	21,288	1,425	14,471	96.4	[illegible]
Nicolet, Wis.	11,969	23,376	11,969	23,376	5,959	12,860	0	10,516	100.0	[illegible]
Total	139,652	301,084	129,305	279,361	94,408	199,055	21,723	80,306	92.6	60.[illegible]

Text Table 3. Summary of Local Control on National Forests, North Central Region.
from Inception to December 31, 1951. All Agencies. Gross Acres

National Forest	First Working			Second Working			Third and Other Workings			All Workings		
	Acres Worked	Ribes Destroyed	Man-Days Used	Acres Worked	Ribes Destroyed	Man-Days Used	Acres Worked	Ribes Destroyed	Man-Days Used	Acres Worked	Ribes Destroyed	Acre Day Used
Shawnee, Illinois	50	0	0	0	0	0	0	0	0	50	0	0
Hoosier, Indiana	179	0	3	0	0	0	0	0	0	179	0	3
Wayne, Ohio	4,029	56	13	0	0	0	0	0	0	4,029	56	13
Huron, Mich.	8,346	66,634	551	2,138	27,282	172	128	464	5	10,612	94,380	728
Manistee, Michigan	72,552	176,989	1,485	15,689	19,619	220	5,698	7,509	93	93,939	204,117	1,798
Hiawatha, Michigan	33,451	724,849	5,727	21,016	130,058	1,953	12,030	48,073	918	66,497	902,980	8,598
Marquette, Michigan	27,487	856,164	7,358	14,035	134,630	2,541	8,400	30,688	665	49,922	1,021,482	10,564
Ottawa, Michigan	30,235	4,286,036	17,075	18,521	829,623	6,450	13,552	161,110	3,228	62,308	5,276,769	36,753
Superior, Minnesota	46,947	6,366,338	30,282	17,852	1,212,185	10,526	11,912	393,703	6,285	76,711	7,972,226	47,093
Chippewa, Minnesota	37,529	3,238,142	14,408	12,866	374,378	3,512	3,541	122,964	992	53,936	3,735,484	18,912
Chequamegon, Wisconsin	41,513	2,868,350	18,065	30,588	715,609	8,897	7,263	205,032	2,865	79,364	3,788,991	29,827
Nicolet, Wisconsin	29,828	2,284,429	14,370	19,381	366,364	4,511	5,905	109,672	1,866	55,114	2,760,465	20,747
Total	332,145	20,867,987	109,337	152,086	3,809,748	38,782	68,429	1,079,215	16,917	552,661	25,756,950	165,035

Note: All work done on Forest Service Blister Rust Control Funds, except for work on other funds, included in above totals, as follows:

Bureau-State	121,714	3,743,469	13,686
Bureau-Intermingled	11,264	254,822	2,767

Text Table 4. Forest Service Funds Spent on Blister Rust Control,
North Central Region, Calendar Year 1951

National Forest	Period: January-June, 1951			Period: July to December, 1951			Calendar Year 1951		
	Salaries	Non-Salaries	Total	Salaries	Non-Salaries	Total	Salaries	Non-Salaries	Total
Hiawatha, Mich.	$ 3,402.08	$ 77.63	$ 3,479.71	$ 5,037.37	$ 335.68	$ 5,373.05	$ 8,439.45	$ 413.31	$ 8,852.76
Ottawa, Mich.	-	-	-	6,659.45	273.98	6,933.43	6,659.45	273.98	6,933.43
Superior, Minn.	13,121.98	578.35	13,700.33	31,038.98	1,051.73	32,090.71	44,160.96	1,628.08	45,789.04
Chippewa, Minn.	5,382.42	231.45	5,613.87	4,223.03	253.80	4,477.63	9,606.25	485.25	10,091.50
Chequamegon, Wis.	4,281.38	-	4,281.38	6,275.29	264.36	6,539.65	10,556.67	264.36	10,821.03
Nicolet, Wis.	2,739.26	106.30	2,845.56	-	151.90	151.90	2,739.26	258.20	2,997.46
Total	$28,929.12	$991.73	$29,920.85	$53,234.92	$2,331.45	$55,566.37	$82,164.04	$3,323.18	$85,487.22

Objective

The objective is to establish and maintain blister rust protection stands on all valuable white pine stands administered by the Indian Service. This involves initial and subsequent eradication of ribes bushes within infecting distances of white pine stands to bring such stands to commercial maturity free from appreciable blister rust damage.

Memorandum of Understanding

Under a Memorandum of Understanding, the Indian Service is responsible for the selection of white pine areas to be protected, and the employment of labor and supervision. The Bureau of Entomology and Plant Quarantine is responsible for preparing work plans and supervising training of labor and supervising, checking on adequacy of control work, keeping records, and making periodic reports of work done.

General Status of Control

As may be seen in Text Table 5, control is being established and maintained around nearly 80,000 acres of white pine on 11 reservations. During 1951 2,274 acres of white pine, chiefly as natural reproduction on the Menominee Reservation, were added to the control problem. Control work on Indian Service white pine stands is unusually [illegible]. In spite of the fact that climatic conditions on the Reservations are generally favorable for the spread of the rust, timely control work has prevented serious damage.

As shown in Text Table 5, over 95 percent of white pine has been worked initially, and over 70 percent is on maintenance. Most of the initial work remaining consists of areas of newly established natural reproduction. Initial working of 6,000 acres and rework of nearly 37,000 acres are scheduled for future years.

Current Work, 1951

In Text Table 4, control work done in 1951 on 5 of the Reservations is shown. Of the 10,900 acres worked about one-third was initial and two-thirds was necessary rework. As a result of past checks and eradication work in 1951 there were 3,548 acres of white pine placed on maintenance. All work done in 1951 was in accordance with a long-time control program for each reservation developed jointly between members of the Indian Service and the Blister Rust Organization.

On the basis of a 2 percent check for ribes after eradication, all of the acreage was satisfactorily worked and checked as having less than 25 feet of live stem per acre. The average for all workings was 4.9 bushes with 5.7 feet of live stem per acre left after eradication.

Expenditures in 1951

Expenditures for rimes eradication on Indian lands during fiscal year 1951 are shown in Test Table 6. These costs are exclusive of maintenance given by employees of the Bureau of Entomology and Plant Quarantine. The average effective man-day, based on 2,136 man days used on rimes eradication (Test Table 4) was $9.64.

Status of Control by Reservations

A brief discussion of blister rust control on each reservation follows. See seperate reports for each Reservation for more detail.

Sac-Fox Reservation - Iowa

This Reservation has 50 acres of fast growing planted pine with a protected area of 500 acres. All of it was initially worked in the middle 20's, partially reworked in 1944, and nearly completely reworked in 1951. Over 10,000 rimes were removed in 1951 from 400 acres. No blister rust infection has been found on pines or ribes on this Reservation. Rimes infection has, however, been found in Tama County.

Grand Portage Reservation - Minnesota

This Reservation, located in the northeastern tip of Minnesota, has 1,203 acres of white pine with 1,503 acres of control area. All but 161 acres of this and 209 acres of control area have been initially worked but the necessary rework has been done since then. Local control here is the most commonly of any of the Reservations. Pines are very abundant particularly in the numerous steep valleys which cut across the white pine areas. Pine infection is extremely severe on the adjacent Canadian side and on other unprotected pine areas. In the protected areas however, rust is not severe. This is good proof of the effectiveness of control work done so far.

In 1951 rework was done on 58 acres from which ribes at the rate of about 350 per acre, were removed. None of the white pine has been placed on maintenance because ribes have not been suppressed to a sufficient degree.

Leech Lake Indian Reservation - Minnesota

The 2,487 acres of white pine, listed in the control area of 3,677 acres lie entirely in that portion of the Reservation known as the "Onigum Unit" on a large peninsula extending into Leech Lake. Part of this acreage is owned by the U. S. Forest Service. Most of the white pine, approximately 80 percent, is on maintenance. No work was done in 1951 and none is contemplated until 1954. The white pine stand on the Leech Lake Reservation is one of the best stands now owned by the Indian Service in this Region.

Nett Lake Indian Reservation - Minnesota

This Reservation has 5,212 acres of white pine in the control area of 7,079 acres. All of this acreage has been initially worked and nearly 90 percent of it is on maintenance. Pine infection is scattered lightly throughout the protected pine and is quite heavy in unprotected white pine stands.

No work has been done since 1940. A small follow-up job, scheduled for 1951 was not done and should be performed in 1952. This is a 3-acre piece of white pine near Watt Lake Village containing American black currants. It is recommended that these be sprayed with a solution of 2,4-D.

Vermilion Indian Reservation - Minnesota

The control problem on this Reservation consists of 78 acres of original stock and 186 of control area. Following the fifth working in 1949, the entire emphasis was placed on maintenance. Only a very small amount of rust can be found on the pine. This again brings out the effectiveness of control since the area originally had a very heavy ribes population and is located where climatic conditions are very favorable for the spread of the rust.

White Earth Indian Reservation - Minnesota

The blister rust control problem here consists of 502 acres of white pine included in a control area of 1,056 acres. Initial underwork was kept blister rust infection to a minimum. The last ribes eradication was done in 1947. Over half of the area is now on maintenance. Post check should be made in 1952 and necessary work, as a result of such survey, planned for 1952 or 1953.

Red Lake Indian Reservation - Minnesota

The Red Lake Indian Reservation has 12,600 acres of white pine in five control problem of 19,143 acres. This is over half the total white pine acreage of all the Indian reservations in Minnesota. The main body of white pine occurs on Ponemah Point. Rust conditions are not severe. Ribes abundance varies from very heavy in the swamps, to light in the sandy, upland soil. Logging in the area has stimulated ribes regeneration making rework necessary. Considering the ribes concentration and the climatic conditions favorable for the spread of the rust, the light infection indicates that control measures to date have been both timely and effective. All of the white pine has been initially worked and approximately 77 percent is on maintenance. Local control was last done in 1950.

It is recommended that a program of post check be undertaken beginning in the summer of 1952 and surveying about 5,000 acres a year. From the findings of these post check surveys, plans for doing necessary local control rework can be made. Extensive logging of mature red and white pine on this Reservation has disturbed ribes conditions to the extent that these surveys are necessary before an intelligent control program can be prepared on these cut-over areas.

Red River Indian Reservation - Wisconsin

As a result of surveys in 1951, the acreage of white pine on the Red River Reservation was increased by 254 acres of white pine and 471 acres of control area to the present total of 8,297 acres of white pine and 14,552 acres of control area. At the present time approximately 99 percent of this white pine has been initially worked and over 95 percent of it is on maintenance.

In 1951, all of the 254 acres of white pine with 471 acres of control area surveyed in 1951 were examined and found to be ribes-free. In addition to this work, 530 acres of white pine included in 697 acres of control area were reworked with nearly 112,000 ribes destroyed.

Time for May and June, 1952, call for the cutting of 180 acres at a cost of approximately 400 man-days. For the period July to September, 1952, it is planned to rework 349 acres at an estimated 170 man-days. The estimated cost of all of this work is $5,700.00.

Lac Court Oreilles Indian Reservation - Wisconsin

There are on this Reservation 23,950 acres of white pine listed in the control area of 25,192 acres. White pine is, on the increase through natural reproduction. It is estimated that there are about 35,000 acres of forest type on this Reservation on which scattered white pine seed trees are found. During the favorable wet years, since 1937, natural white pine reproduction has been coming back very well.

Blister rust infection is quite generally distributed over the Reservation doing considerable damage in unprotected areas and very little in protected areas.

Nearly 97 percent of the white pine on this Reservation has been initially worked and 62 percent is on maintenance. The remaining initial work consists primarily of newly found young white pine trees.

A substantial program of pine conservation work was completed on the Reservation in 1951. This cost $15,705.00 and nearly 1,161 man-days. Approximately 111,400 pines were removed from 4,114 acres to give protection to 2,454 acres of pine. All of this was remote except initial working of 449 acres to protect 167 acres of white pine.

For the Calendar Year 1952, plans are for working 2,811 acres to protect and maintain protection for over 2,600 acres of white pine. It is estimated that this work will require 970 man-days and cost $8,700.00. This work is part of a long-term plan for covering the white pine acreage at approximate 5-year intervals until maintenance status is reached.

Lac du Flambeau Indian Reservation - Wisconsin

The Lac du Flambeau Reservation, like the Lac Court Oreilles, has many very good white pine sites that are steadily increasing as new reproduction comes in. No work was done on this Reservation in 1951. The status of the working at present is that 98 percent of the white pine acreage has been initially worked and nearly 86 percent is on maintenance.

Plans are made for performing local control in calendar year 1952 over an estimated 3,000 acres of control area still need examination work. It is estimated that 400 man-days will be needed at a cost of about $4,000.00.

Menominee Indian Reservation - Wisconsin

The Menominee contains the largest amount of white pine of all the reservations in this Region. The pine is of all age classes ranging from large saw timber to reproduction which continues to come in on favorable white pine sites. Most of the increase is taking place on the higher soil types east of the Wolf River where reproduction is becoming established under oak, red pine and jack pine.

The total removal program includes nearly 43,000 acres of white pine and 18,400 acres of control area. Surveys in 1951 brought to an increase of 7,310 acres due to new acreage restocking to white pine. Besides the acreage in the existing control problem, there is an estimated additional 10,000 acres composed largely by mature stands of white pine with an estimated volume in excess of 100,000,000 board feet. This acreage will probably not continue to white pine after cutting but will go into hardwoods. If, however, satisfactory white pine reproduction does occur after logging, such acreage will be included in the control problem.

At the end of 1951, a little over 22 percent of the white pine acreage in the control problem had been initially worked and nearly 29 percent was in maintenance.

Rust conditions are very heavy in impregnated stands in the vicinity. However, due to effective and timely ribes eradicating, the rust has been kept from doing serious damage on the Reservation. Blister rust is certainly a necessary part of a long-time sustained yield management plan for white pine on this Reservation.

A substantial control program was carried on in 1951. Approximately [illegible] acres were worked to give protection to about 3,000 acres of white pine equally between initial and remark. As in the past, Indian women made up the ribes eradication crews. The most effective work was again accomplished during May and June, a period when ribes are in leaf before the appearance of luxurious fern and most herbaceous growth. So far as possible, ribes eradication work should be concentrated during this period. Later on there is less effective work done due to a combination of hot weather, more insect pests and reduced visibility in the woods. Tribal funds matched by appropriated Indian Service funds are used for control work on this Reservation. During the period May and June, a total of $7,905.00 was spent from appropriated funds. During the period July to September, funds consisted entirely of Tribal funds for a total of $6,470.00. The average cost for effective man-day labor in 1951 was $7.05 as compared with $7.53 in 1950.

In 1950, a 10-year work plan was prepared to place an maintenance all white pine stands on the Reservation. The proposed plan for 1952 is in keeping with this 10-year work plan except that the addition of about 1,000 acres of additional white pine reproduction, scraped during the past year, had to be included in the overall plan. Much of this acreage appears to be ribes free so the inclusion of this additional work will not materially affect the schedule. It is proposed to do as much work as possible during the period May, June and July. For the Calendar Year 1952, it is planned to do remark on 2,565 acres of control area to protect 2,122 acres of white pine at an estimated cost of 400 man days.

Text Table 5. Local Control on Indian Reservations: All Workings by Indian Service
North Central Region, 1951

Indian Reservation	No. of Areas	Acres White Pine Protected	Acres Control Area Worked	Trees Number Destroyed	Man-Days Used
Initial Working					
Bad River, Wis.	3	254	471	—	—
Lac Court Oreilles, Wis.	5	185	449	26,793	119
Menominee, Wis.	7	1,565	2,570	45,255	660
Total, Initial Working	15	2,004	3,490	72,048	797
Second Working					
Sac-Fox, Iowa	3	40	250	8,351	94
Bad River, Wis.	1	70	112	21,415	447
Lac Court Oreilles, Wis.	6	1,762	3,922	13,009	1,295
Total, Second Working	10	1,872	4,284	42,774	1,836
Third and Other Workings					
Sac-Fox, Iowa	1	10	150	2,416	58
Grand Portage, Minn.	2	56	56	19,649	163
Bad River, Wis.	2	460	585	10,725	119
Lac Court Oreilles, Wis.	3	507	741	6,137	244
Menominee, Wis.	1	1,500	2,600	28,232	1,314
Total, Third and Other	9	2,533	4,132	66,668	1,898
All Workings					
Sac-Fox, Iowa	4	50	400	10,786	152
Grand Portage, Minn.	2	56	56	19,649	163
Bad River, Wis.	6	734	1,168	111,690	579
Lac Court Oreilles, Wis.	14	2,454	4,112	110,939	1,301
Menominee, Wis.	8	3,065	5,170	62,487	2,026
Total, All Workings	34	6,409	10,906	315,519	4,135

Text Table 6. Status of Control on Indian Reservations, North Central Region, on December 31, 1951

Net Acres

Indian Reservation	Acres in Total Control Problem: White Pine	Acres in Total Control Problem: Control Area	Acres Initially Worked: White Pine	Acres Initially Worked: Control Area	Acres On Maintenance: White Pine	Acres On Maintenance: Control Area	Acres Control Area Needing Work: Initial	Acres Control Area Needing Work: Rework	Percent Acres White Pine Initially Worked
Iowa									
Sac-Fox, Iowa	50	500	50	500	-	-	-	500	100.0
Minnesota									
Grand Portage	1,097	1,503	974	1,294	-	-	209	1,294	88.8
Vermilion	78	186	78	186	78	186	-	-	100.0
Nett Lake	5,212	7,079	5,212	7,079	4,770	6,238	-	841	100.0
Leech Lake	2,487	3,472	2,432	3,387	2,076	2,755	85	632	97.8
White Earth	502	1,056	502	1,056	231	545	-	511	100.0
Red Lake	12,604	19,143	12,604	19,143	10,460	14,789	-	4,354	100.0
Total, Minnesota	21,980	32,439	21,802	32,145	17,615	24,513	294	7,632	99.2
Wisconsin									
Bad River	8,547	15,023	8,451	14,846	8,146	13,519	177	1,327	98.9
Lac Court Oreilles	13,952	25,399	13,465	24,171	8,642	15,653	1,228	8,518	96.5
Lac du Flambeau	13,453	23,367	11,053	22,367	10,586	20,566	1,000	1,801	96.0
Menominee	22,897	38,412	21,114	35,207	11,173	18,120	3,205	17,087	92.2
Total, Wisconsin	57,849	102,201	54,083	96,591	38,587	67,858	5,610	28,733	95.0
Total, Region	79,879	134,640	75,935	128,736	56,202	92,371	5,904	36,365	95.2

Text Table 7. Summary of Local Control Performed on Indian Reservations, North Central Region.
From Inception to December 31, 1951. Work Done by Indian Service Except as Noted.
Gross Acres

Indian Reservation	First Working			Second Working			Third and Other Workings			All Workings		
	Acres Worked	Ribes Destroyed	Man-Days Used	Acres Worked	Ribes Destroyed	Man-Days Used	Acres Worked	Ribes Destroyed	Man-Days Used	Acres Worked	Ribes Destroyed	Man-Days Used
Iowa												
Sac-Fox	500	13,462	169	456	11,943	421	150	2,435	26	1,106	27,840	
Minnesota												
Grand Portage	1,620	2,367,154	4,525	835	336,405	1,367	375	71,064	452	2,830	2,774,623	
Vermilion	286	137,530	424	206	29,912	210	435	41,679	485	927	209,121	
Nett Lake	7,126	527,722	1,841	3,611	321,890	2,604	1,765	209,484	1,966	12,502	1,059,096	
Leech Lake(a)	3,323	376,885	1,007	3,012	197,460	831	502	90,689	376	6,837	665,034	
White Earth(b)	1,354	398,705	1,178	916	204,927	673	808	134,029	543	3,080	737,661	
Red Lake	20,836	6,750,239	11,321	18,902	1,743,630	7,665	15,993	1,268,837	7,992	55,732	9,762,706	
Total, Minn.	34,547	10,560,235	20,296	27,483	2,834,224	13,370	19,878	1,815,782	11,814	81,908	15,210,241	
Wisconsin												
Bad River	15,248	8,216,852	18,888	8,321	1,398,661	6,005	5,869	687,949	3,591	29,438	10,303,462	
Lac Court Oreilles	20,583	1,570,944	11,511	13,439	542,854	4,860	4,279	22,985	846	38,301	2,136,783	
Lac du Flambeau	22,464	771,317	4,389	6,866	48,033	401	1,436	481	11	30,766	819,831	
Menominee	42,812	10,372,672	35,825	19,177	1,731,826	15,095	8,816	227,906	5,295	70,805	12,332,404	
Total, Wis.	101,107	20,931,815	70,613	47,803	3,721,374	26,361	20,400	939,321	9,743	169,310	25,592,510	
Total, Region	136,154	31,505,512	91,076	75,742	6,567,541	39,854	40,428	2,757,538	21,583	252,324	40,870,591	
Includes work done on Bur-State funds as follows:												
(a) Leech Lake	1,675	52,533	275	532	44,189	211	-	-	-	2,307	96,722	
(b) Wh. Earth	982	252,747	691	-	-	-	-	-	-	982	252,747	
Total	2,657	305,280	966	532	44,189	211	-	-	-	3,289	349,469	

Text Table 8. Indian Service Funds Spent on Blister Rust Control, North Central Region, Calendar Year 1951
(All appropriated Indian Service Funds, except Menominee Tribal Funds)

Reservation	Period: January-June, 1951 Salaries	Non-Salaries	Total	Period: July-December, 1951 Salaries	Non-Salaries	Total	Calendar Year 1951 Salaries	Non-Salaries	Total
Consolidated Chippewa, Minnesota									
Grand Portage, Minnesota	$ 1,614.80	-	$ 1,614.80	-	-	-	$ 1,614.80	-	$ 1,614.80
Great Lakes Agency									
Sac-Fox, Iowa	372.30	-	372.30	-	-	-	372.30	-	372.30
Red River, Wis.	3,863.42	$ 577.16	4,440.58	$ 3,191.85	$130.00	$ 3,321.85	7,055.27	$ 707.16	7,762.43
Lac Court Oreilles, Wisconsin	6,402.81	865.78	7,268.59	7,989.57	505.00	8,494.57	14,392.38	1,370.78	15,763.16
Total, Great Lakes	10,638.53	1,442.94	12,081.47	11,181.42	635.00	11,816.42	21,819.95	2,077.94	23,897.89
Menominee Agency									
Indian Service Funds	7,448.00	450.00	7,898.00	-	-	-	7,448.00	450.00	7,898.00
Tribal Funds	-	-	-	6,309.00	161.00	6,470.00	6,309.00	161.00	6,470.00
Total, Menominee	7,448.00	450.00	7,898.00	6,309.00	161.00	6,470.00	13,757.00	611.00	14,368.00
All Agencies									
Indian Service Funds	19,701.33	1,892.94	21,594.27	11,181.42	635.00	11,816.42	30,882.75	2,527.94	33,410.69
Tribal Funds	-	-	-	6,309.00	161.00	6,470.00	6,309.00	161.00	6,470.00
All Funds	$19,701.33	$1,892.94	$21,594.27	$17,490.42	$796.00	$18,286.42	$37,191.75	$2,688.94	$39,880.69

Table 1. Surveys Performed in North Central Region, Calendar Year 1951

State	Type of Survey	Acres Previously Mapped: White Pine	Acres Previously Mapped: Control Area	Acreage Increase: White Pine	Acreage Increase: Control Area	Acreage Decrease: White Pine	Acreage Decrease: Control Area	Total Acres Mapped: White Pine	Total Acres Mapped: Net Control Area	Crews Days Worked
Illinois	Pre-eradication	-	-	109	275	-	-	109	275	6
	Re-Survey	23	947	3	-	15	709	16	238	7
	Post-Check	117	1,407	-	-	42	857	75	550	18
	Total	140	2,354	112	275	57	1,566	200	1,063	31
Iowa	Pre-eradication	-	-	17	50	-	-	17	50	1
	Re-Survey	17	52	9	41	-	-	26	93	3
	Post-Check	70	553	8	57	-	-	78	610	3
	Total	87	605	34	148	-	-	121	753	6
Ohio	Pre-eradication	-	-	771	1,246	-	-	771	1,246	11
	Re-Survey	57	691	40	4	-	361	97	434	5
	Post-Check	619	2,559	113	438	20	945	712	1,952	15
	Total	676	3,250	924	1,688	20	1,306	1,580	3,632	31
Michigan	Pre-eradication	-	-	2,933	12,501	-	-	2,933	12,501	82
	Re-Survey	368	3,819	82	140	101	1,932	249	2,027	19
	Post-Check	12,528	31,549	1,500	2,569	3,776	8,147	10,252	25,771	80
	Total	12,896	35,368	4,515	15,210	3,877	10,079	13,434	40,299	181
Minnesota	Pre-eradication	-	-	1,277	2,669	-	-	1,277	2,669	104
	Re-Survey	24,400	39,680	849	910	21,729	34,604	3,519	5,986	256
	Post-Check	4,733	8,290	81	17	559	988	4,255	7,419	149
	Total	29,133	47,970	2,207	3,596	22,288	35,592	9,051	16,074	509
Wisconsin	Pre-eradication	-	-	20,441	42,345	-	-	20,441	42,345	151
	Re-Survey	1,786	14,482	98	75	581	6,856	1,303	7,701	14
	Post-Check	15,318	37,680	1,571	1,804	1,027	4,701	15,862	34,783	170
	Total	17,104	52,162	22,110	44,224	1,608	11,557	37,606	84,829	335
Region	Pre-eradication	-	-	25,548	59,086	-	-	25,548	59,086	353
	Re-Survey	26,555	59,671	1,080	1,170	22,426	44,362	5,210	16,479	548
	Post-Check	35,385	81,038	3,273	4,685	5,424	15,538	31,254	70,985	473
	Total	61,940	140,709	29,901	64,941	27,850	59,900	61,992	145,550	1,374

Table [illegible] Summary of Logging Control by States and Contributing Agencies
in Central Region, Calendar Year 1961

[illegible]	Operating Agency	Number Areas Worked	Acres White Pine Protected: Natural	Planted	Total	Acres Worked	Ribes Destroyed	Total Man Days Used
Initial Working								
[illegible]nois	Bureau-State	5	-	94	94	235	7,035	21
[illegible]a	Bureau-State	6	3	18	21	115	9,190	56
[illegible]o	Bureau-State	11	20	142	162	970	5,757	45
[illegible]digan	Bureau-State	121	779	1,182	1,961	11,241	11,124	293
	Forest Service	4	378	-	378	1,320	22,567	141
	Total	125	1,157	1,182	2,339	12,561	33,691	434
[illegible]esota	Bureau-State	6	158	99	257	617	33,735	191
	Forest Service	7	305	-	305	412	33,985	446
	Total	13	463	99	562	1,029	67,719	637
[illegible]consin	Bureau-State	77	13,059	549	13,608	35,443	216,570	1,296
	Forest Service	8	1,023	-	1,023	1,561	81,067	216
	Indian Service	15	2,004	-	2,004	3,490	71,048	797
	Total	100	16,086	549	16,635	40,494	368,685	2,309
[illegible]ion	Bureau-State	224	14,009	2,090	16,099	48,319	283,459	1,866
	Forest Service	19	1,706	-	1,706	3,293	132,619	1,304
	Indian Service	15	2,004	-	2,004	3,490	71,048	797
	Total	258	17,719	2,090	19,809	55,102	487,126	3,967
Second Working								
[illegible]incoln	Bureau-State	5	-	56	56	326	4,914	24
[illegible]e	Bureau-State	8	30	36	66	317	20,173	159
	Indian Service	3	-	40	40	250	8,351	66
	Total	11	30	76	106	567	28,524	225
[illegible]d	Bureau-State	10	-	149	149	707	2,532	49
[illegible]chigan	Bureau-State	30	4,155	2	4,157	8,618	71,220	697
	Forest Service	18	2,100	83	2,183	5,509	36,198	791
	Total	48	6,255	85	6,340	14,127	107,418	1,488
[illegible]nesota	Bureau-State	4	117		117	275	31,728	984
	Forest Service	17	1,755	15	1,770	2,660	87,785	1,360
	Total	21	1,872	15	1,887	2,935	119,513	2,344
[illegible]consin	Bureau-State	59	7,108	522	7,630	18,438	34,616	337
	Forest Service	4	321		321	680	14,399	175
	Indian Service	7	1,821	11	1,832	3,034	89,423	1,170
	Total	70	9,250	533	9,783	22,152	138,437	1,682
[illegible]ion	Bureau-State	114	11,410	765	12,175	28,681	185,171	1,060
	Forest Service	39	4,176	98	4,274	8,849	138,381	2,664
	Indian Service	10	1,821	51	1,872	3,284	97,974	1,206
	Total	163	17,407	914	18,321	40,814	421,526	4,930

(Cont'd)

Table 5. Summary of [illegible] Control by States and Operating Agencies [illegible] Region Calendar Year [illegible] (Continued)

State	Operating Agency	Number Areas Worked	Acres White Pine Protected: Natural	Planted	Total	Acres Worked	Ribes Destroyed	Total Man-Days Used
			Third and Subsequent Workings					
llinois	Bureau-State	1	-	88	88	108	3,734	24
[illegible]	Bureau-State	3	30	24	54	195	7,887	36
	Indian Service	1	-	10	10	150	2,435	[illegible]
	Total	4	30	[illegible]	[illegible]	345	[illegible]	[illegible]
hio	Bureau-State	5	19	518	537	1,078	2,929	75
ichigan	Bureau-State	36	3,497	984	4,481	9,928	80,385	1,191
	Forest Service	23	3,756	1,380	5,136	10,637	63,816	964
	Total	59	7,253	2,364	9,617	20,565	144,201	2,155
innesota	Forest Service	18	861	827	1,688	2,294	93,879	1,762
	Indian Service	2	56	-	56	56	19,649	123
	Total	20	917	827	1,744	2,350	113,528	1,885
isconsin	Bureau-State	5	678	137	815	1,370	26,259	534
	Forest Service	4	126	1,391	1,517	2,833	21,347	342
	Indian Service	6	2,414	53	2,467	3,926	144,904	1,953
	Total	15	3,218	1,581	4,799	8,129	192,510	2,829
egion	Bureau-State	50	4,224	1,689	5,913	12,884	128,135	1,890
	Forest Service	45	4,743	3,598	8,341	15,754	159,342	3,056
	Indian Service	9	2,470	63	2,533	4,132	166,683	2,105
	Total	104	11,437	5,350	16,787	32,870	454,160	7,050
			All Workings					
llinois	Bureau-State	7	-	176	176	669	15,741	69
[illegible]	Bureau-State	17	63	78	141	626	37,240	289
	Indian Service	4	-	50	50	400	10,788	83
	Total	21	63	128	191	1,026	48,028	372
hio	Bureau-State	26	29	815	844	2,419	13,147	143
ichigan	Bureau-State	187	8,431	2,168	10,599	29,797	152,789	3,080
	Forest Service	45	6,234	1,463	7,697	17,456	102,521	1,026
	Total	232	14,665	3,631	18,296	47,253	255,310	4,086
innesota	Bureau-State	10	275	99	374	892	88,451	433
	Forest Service	42	2,921	842	3,763	5,386	210,649	3,569
	Indian Service	2	56	-	56	56	19,649	123
	Total	54	3,252	941	4,193	6,334	318,759	4,125
isconsin	Bureau-State	141	20,869	1,209	22,088	55,331	277,445	1,985
	Forest Service	16	1,470	1,391	2,861	5,074	117,112	1,631
	Indian Service	28	6,239	64	5,503	10,450	305,075	3,920
	Total	185	28,534	2,665	31,217	70,775	699,632	7,535
egion	Bureau-State	388	29,645	4,544	34,187	89,884	596,763	5,181
	Forest Service	103	10,625	3,696	14,321	27,896	430,342	7,025
	Indian Service	34	6,295	114	6,409	10,906	335,510	4,135
	Total	525	46,563	8,354	54,917	128,486	1,362,615	16,340

Table 3- Summary of Acres White Pine Protected and Acres Worked
By States, Ownership Classes and Workings
North Central Region, Calendar Year 1951

State	Ownership Class	Initial Workings		Second Workings		Other Workings		All Workings	
		Acres White Pine Protected	Acres Worked	Acres White Pine Protected	Acres Worked	Acres White Pine Protected	Acres Worked	Acres White Pine Protected	Acres Worked
Illinois	Private	7	61	6	96	26	108	39	265
	Non-Fed. Public	89	174	50	233	-	-	139	407
	Total	96	235	56	326	26	108	178	669
Iowa	Private	15	51	6	69	24	126	45	371
	Non-Fed. Public	6	30	60	256	30	70	96	356
	Indian Service	-	-	40	250	10	150	50	400
	Total	22	113	106	567	64	346	191	1,026
Ohio	Private	107	510	142	709	80	814	316	2,451
	Non-Fed. Public	51	160	-	-	497	258	688	1,018
	Total	158	670	142	709	537	1,072	844	3,449
Michigan	Private	1,050	5,757	1,776	3,833	2,576	6,336	5,507	19,151
	Non-Fed. Public	741	2,149	2,352	4,780	1,780	3,852	4,905	10,781
	Forest Service	548	1,855	2,163	5,809	5,181	10,747	7,886	18,911
	Total	2,339	12,361	6,640	14,127	9,537	20,365	18,296	47,253
Minnesota	Private	173	389	2	6	-	-	175	395
	Non-Fed. Public	82	145	115	269	-	-	197	399
	Forest Service	306	414	1,770	2,660	1,888	2,894	3,763	5,968
	Indian Service	-	-	-	-	56	56	56	56
	Total	561	1,028	1,887	2,935	1,944	2,950	4,192	6,914
Wisconsin	Private	1,906	9,256	3,959	11,671	37	85	5,704	21,012
	Non-Fed. Public	11,900	26,187	3,671	5,787	978	1,265	16,549	34,239
	Forest Service	1,067	1,561	321	680	1,517	2,933	2,851	5,074
	Indian Service	2,004	3,490	1,839	3,034	2,467	3,926	6,309	10,450
	Total	16,655	40,494	9,783	22,152	4,799	8,129	31,217	70,775
Region	Private	3,047	19,156	5,877	16,377	2,823	7,089	11,787	42,622
	Non-Fed Public	12,869	29,828	6,276	12,304	3,285	5,475	22,511	47,607
	Forest Service	1,870	3,828	4,254	9,149	8,366	15,574	14,520	28,551
	Indian Service	2,004	3,490	1,879	3,284	2,533	4,132	6,409	10,906
	Total	19,790	56,302	18,581	40,814	16,787	32,570	54,917	129,686

Table 4. Results of Checking after Ribes Eradication by States, North Central Region
Checking Year, 1951

State	Ownership Class	Acres Worked and Checked	Strip Acres	Ribes Found Bushes	Ribes Found F.L.S.	Ribes per Acre Bushes	Ribes per Acre F.L.S.	Classification of Worked Areas on Basis of Ribes F.L.S. per acre after Eradication 0.0-15.0 F.L.S. (Acres)	15.1-65.0 F.L.S. (Acres)	Over 65 F.L.S. (Acres)
Illinois	State-Private	561	24.00	14	65.0	0.6	2.7	561		
Iowa	State-Private	604	29.00	98	150.0	4.0	9.5	604	23	
	Cullen Service	400	10.00	45	112.0	4.5	11.2	400	-	
	Total	1,004	39.00	138	277.0	4.5	8.9	1,004	23	
Ohio	State-Private	1,987	99.60	80	250.5	3.1	9.8	1,909	27	51
Michigan	State-Private	13,821	540.10	38	450.5	0.8	0.7	13,821	-	-
	Forest Service	16,541	820.70	240	435.3	0.3	1.0	16,541	-	-
	Total	30,362	960.80	340	785.8	0.6	1.8	30,362	-	-
Minnesota	State-Private	42,951	1,061.80	274	1,974.8	0.9	1.9	42,951	-	-
	Forest Service	5,095	128.80	360	908.9	2.9	8.1	5,035	59	-
	Indian Service	8,667	177.90	501	984.2	2.9	8.4	8,667	300	-
	Total	56,713	1,368.50	1,830	3,695.1	1.4	2.5	56,485	359	
Region	State-Private	60,868	1,830.72	1,304	3,001.7	0.9	2.0	60,691	243	34
	Forest Service	36,975	860.26	940	2,063.0	1.4	3.7	36,878	101	-
	Indian Service	9,067	187.90	555	1,066.2	2.9	5.7	8,867	300	-
	Grand Total	96,910	2,848.88	2,846	6,130.9	1.8	2.4	96,210	644	34

Table 4. Results of Surveys after Ribes Eradication by States, North Central Region
Calendar Year, 1951

State	Ownership Class	Acres Worked and Checked	Strip Acres	Ribes Found Bushes	Ribes Found P.L.S.	Ribes per Acre Bushes	Ribes per Acre P.L.S.	Classification of Worked Areas on Basis of Ribes P.L.S. per acre after Eradication 0 0-15.0 P.L.S. (Acres)	15.1-25.0 P.L.S. (Acres)	Over 25 P.L.S. (Acres)
Illinois	State-Private	881	34.00	14	65.1	0.6	2.9	68.	-	-
Iowa	State-Private	695	50.00	80	163.0	4.0	9.6	604	25	-
	Indian Service	300	10.00	45	112.0	4.5	11.2	400	-	-
	Total	1,095	88.00	138	877.0	4.3	9.0	1,004	25	-
Ohio	State-Private	1,987	90.80	80	256.0	3.1	9.8	1,805	91	91
Michigan	State-Private	13,991	340.10	96	899.8	0.3	0.7	13,891	-	-
	Forest Service	16,541	880.70	965	1,956.6	0.9	1.8	16,341	-	-
	Total	30,532	680.80	945	725.3	0.9	1.8	30,362	-	-
Minnesota	State-Private	849	40.00	200	806.9	2.7	6.6	655	190	-
	Forest Service	5,355	260	526	859.6	1.4	3.6	5,298	66	-
	Total	6,250	470	726	1,376.4	1.5	4.2	6,991	196	66
Wisconsin	State-Private	48,981	1,051.80	994	1,994.2	0.9	1.9	48,961	-	-
	Forest Service	3,071	138.60	889	704.9	2.9	5.1	3,070	53	-
	Indian Service	2,667	199.90	807	554.2	2.8	5.4	2,617	250	-
	Total	54,719	1,390.50	1,850	3,635.1	1.4	2.5	54,655	929	-
Region	State-Private	60,868	1,890.92	1,354	3,001.9	0.9	2.0	60,471	345	91
	Forest Service	26,973	660.86	940	2,063.0	1.4	3.1	26,876	101	-
	Indian Service	4,057	187.90	556	1,066.2	2.9	6.7	3,867	300	-
	Grand Total	95,905	2,540.88	2,840	6,130.1	1.2	2.8	95,210	846	154

Table 5. Control Area Permits, North Central Region, Calendar Year 1952

State	Number of Applications Received	Number of Permits Approved	Number of Applications: Rejected	Voluntarily Cancelled by Applicant	Percent Applications Approved	Approximate Number Man-days Used
Michigan	143	82	42	39	43.2	7
Minnesota	81	68	2	5	96.9	5
Ohio	74	13	6	5	54.9	2
Wisconsin	197	198	0	2	99.5	5
Region Total	465	365	50	50	75.5	19

Table [illegible]. Status of Control by States and Districts, North Central Region
on December 31, 1951

Net Acres

District	Acres Total Control Problem: Natural White Pine	Planted White Pine	Total White Pine	Control Area	Acres Initially Worked: Natural White Pine	Planted White Pine	Total White Pine	Control Area	Acres Not Initially Worked: White Pine	Control Area	Acres on Maintenance: White Pine	Control Area
Illinois												
Entire State	251	1,806	2,037	12,192	226	1,721	1,947	10,697	90	1,495	584	1,51[illegible]
Indiana												
Entire State	323	9,922	10,245	91,889	255	8,351	5,914	75,732	1,631	13,157	7,951	51,50[illegible]
Iowa												
Entire State	717	5,252	5,969	89,649	367	4,805	5,472	64,570	2,497	15,979	1,609	18,[illegible]
Ohio												
Entire State	3,169	18,897	22,065	215,856	3,058	13,297	16,355	173,651	5,659	35,195	9,254	39,2[illegible]
Michigan												
L. Peninsula	187,874	64,922	252,796	880,942	178,094	60,794	238,888	787,678	13,908	73,264	103,348	[illegible]
Up. Peninsula	129,880	14,908	142,848	589,969	112,142	14,949	127,091	291,770	16,757	38,199	69,878	[illegible]
Entire State	316,754	79,830	395,644	1,190,911	290,236	75,743	365,979	1,079,448	30,665	111,463	172,226	51[illegible]
Minnesota												
Eastern Minn.	75,971	6,884	82,855	214,155	53,028	5,943	58,971	142,955	24,884	71,218	16,727	29,[illegible]
Western Minn.	119,273	6,098	125,371	281,225	98,111	5,376	103,487	223,473	21,884	57,758	50,516	59,[illegible]
Entire State	195,244	12,982	208,226	495,378	151,139	11,319	162,458	366,408	46,168	128,970	67,243	115,0[illegible]
Wisconsin												
Eastern Wis.	178,032	19,851	197,882	664,396	159,442	18,374	177,816	585,846	19,475	78,550	85,420	[illegible]
Western Wis.	267,449	17,386	284,835	861,403	228,916	15,728	245,644	693,096	39,191	168,307	144,787	[illegible]
Entire State	445,510	36,617	482,127	1,525,799	389,358	34,102	423,460	1,278,942	58,659	246,857	230,207	[illegible]
Region												
Entire Region	962,937	164,756	1,127,693	3,280,574	838,008	147,875	985,888	3,027,558	145,209	556,115	486,377	1,462,[illegible]

TABLE 2 - STATUS OF CONTROL FOR WHITE PINE BLISTER RUST, NORTH CENTRAL STATES
AS OF DECEMBER 31, 1963

Net Acres

Ownership Class	Acres Total Control Problem: Natural White Pine	Planted White Pine	Total White Pine	Control Area	Acres Initially Worked: Natural White Pine	Planted White Pine	Total White Pine	Control Area	Acres Not Initially Worked: White Pine	Control Area	Acres On Maintenance: White Pine	Control Area
Illinois												
Non-Fed. Pub.	197	998	1,195	6,165	192	982	1,174	5,972	21	194	648	1,850
Private	94	908	842	6,026	34	739	773	4,725	69	1,301	98	3,001
Total	291	1,906	2,037	12,192	226	1,721	1,947	10,697	90	1,495	594	1,847
Indiana												
For. Service	-	18	18	179	-	18	18	179	-	-	18	18
Non-Fed. Pub.	93	3,070	4,169	18,808	93	2,968	5,069	17,971	119	857	5,364	14,0[illegible]
Private	284	6,854	7,068	72,862	234	5,415	5,630	60,582	1,419	12,870	4,982	46,91[illegible]
Total	525	9,962	10,245	91,859	523	8,581	8,714	78,732	1,531	13,157	7,864	61,504
Iowa												
Fed. Service	-	50	50	500	-	50	50	500	-	-	-	-
Non-Fed. Pub.	348	241	589	3,685	348	240	588	3,673	1	52	11	3[illegible]
Private	389	4,961	5,350	48,624	319	2,515	2,834	30,597	2,496	13,927	1,596	15,[illegible]
Total	737	5,252	5,969	50,649	667	2,805	3,472	34,670	2,497	13,979	1,607	18,[illegible]
Ohio												
For. Service	-	515	515	4,029	-	515	515	4,029	-	-	515	4,029
Non-Fed. Pub.	854	7,907	8,761	54,981	854	4,962	5,816	43,100	3,945	11,881	2,780	16,9[illegible]
Private	2,304	10,485	12,789	105,296	2,205	7,800	10,005	131,539	2,764	25,764	4,979	66,[illegible]
Total	3,158	18,907	22,065	223,366	3,059	13,297	16,356	178,681	5,689	35,185	8,254	89,[illegible]
Michigan												
For. Service	92,235	35,695	62,908	166,955	89,180	33,695	62,911	166,430	197	585	64,979	197,[illegible]
Fed. Fr. Ser.	15	-	15	120	15	-	15	120	-	-	-	-
Non-Fed. Pub.	93,581	85,695	123,476	302,304	88,951	88,625	117,576	281,543	5,900	20,461	64,063	140,[illegible]
Private	103,925	16,320	850,845	920,532	172,085	13,536	185,577	332,035	24,558	90,467	64,394	257,[illegible]
Total	313,756	79,690	396,644	1,190,911	260,250	75,763	385,979	1,079,448	30,655	111,463	173,436	514,[illegible]

(Contd.)

Table 7. Status of Control by States and Ownership Classes, North Central Region on December 31, 1951 (Cont'd.)

Net Acres

Ownership Class	Acres Total Control Problem: Natural White Pine	Acres Total Control Problem: Planted White Pine	Acres Total Control Problem: Total White Pine	Acres Total Control Problem: Control Area	Acres Initially Worked: Natural White Pine	Acres Initially Worked: Planted White Pine	Acres Initially Worked: Total White Pine	Acres Initially Worked: Control Area	Acres Not Initially Worked: White Pine	Acres Not Initially Worked: Control Area	Acres On Maintenance: White Pine	Acres On Maintenance: Control Area
Minnesota												
Nat. Service	37,048	5,195	42,243	70,451	27,684	5,195	32,879	50,688	9,364	19,763	21,4[illegible]	[illegible]
Ind. Service	21,651	329	21,980	59,740	21,473	329	21,802	59,146	178	594	17,615	[illegible]
Non-Fed. Pub.	49,809	6,377	56,186	116,780	34,354	5,344	39,698	76,195	16,488	40,585	13,187	[illegible]
Private	97,736	481	98,217	576,819	67,623	451	68,074	537,469	30,143	39,350	15,040	[illegible]
Total	206,244	12,382	218,626	823,790	151,134	11,319	162,453	723,498	56,173	100,292	67,846	137,04[illegible]
Wisconsin												
Nat. Service	25,858	10,110	35,968	60,580	25,078	10,110	35,188	59,125	780	1,455	17,0[illegible]	[illegible]
Ind. Service	57,304	685	57,989	102,201	54,309	685	54,994	95,591	2,995	6,610	36,[illegible]	[illegible]
Non-Fed. Pub.	108,179	17,523	125,702	360,105	106,800	17,151	123,951	350,739	1,751	9,366	65,068	[illegible]
Private	356,249	6,329	364,578	1,009,933	305,098	6,210	311,314	772,477	53,264	237,456	104,351	[illegible]
Total	548,620	35,017	583,128	1,526,769	489,362	34,102	523,460	1,277,932	59,667	246,857	228,207	580,[illegible]
Region												
Nat. Service	90,139	49,513	139,652	301,084	79,944	49,361	129,305	279,331	10,347	21,753	86,409	[illegible]
Ind. Service	78,875	1,004	79,879	185,140	75,831	1,004	76,835	179,236	3,044	5,904	55,902	[illegible]
Natl. Pk. Ser.	15	-	15	150	15	-	15	150	-	-	-	-
Non-Fed. Pub.	252,067	66,041	318,108	854,348	231,628	60,282	291,910	779,374	26,198	74,974	148,505	[illegible]
Private	530,931	58,108	589,039	1,839,982	447,590	36,731	484,321	1,389,467	104,718	450,515	197,258	[illegible]
Total	956,807	166,785	1,126,693	3,180,704	835,008	147,378	982,386	2,627,558	144,307	553,146	485,677	1,469,0[illegible]

Table 8. Summary of Ribes Eradication by States and Operating Agencies, Cumulative [illegible], 1918-1931, Inc.

Oper. Agency	First Working: Acres Worked	First Working: Ribes Destroyed	First Working: Man-Days Used	Second Working: Acres Worked	Second Working: Ribes Destroyed	Second Working: Man-Days Used	Third & Other Workings: Acres Worked	Third & Other Workings: Ribes Destroyed	Third & Other Workings: Man-Days Used	All Workings: Acres Worked	All Workings: Ribes Destroyed	All Workings: Man-Days Used
Illinois												
Bur-St.	20,225	1,515,980	3,904	10,534	618,205	2,543	13,197	570,162	5,692	44,117	2,703,167	10,[illegible]
Indiana												
Bur-St.	93,126	475,924	4,040	24,079	105,627	1,122	12,042	35,463	356	129,247	616,014	5,[illegible]
Iowa												
Ind. Ser.	500	15,462	189	456	11,943	125	150	9,435	26	1,106	37,840	[illegible]
Bur-St.	58,841	3,601,687	27,297	7,647	731,783	5,411	1,990	156,014	1,519	48,478	4,489,479	[illegible]
Total	59,341	3,616,149	27,436	8,103	743,723	5,536	2,140	155,449	1,545	49,584	4,517,319	[illegible]
Ohio												
Bur-St.	212,102	2,080,462	20,061	63,049	726,678	13,473	17,216	165,564	2,336	292,385	2,490,992	19,[illegible]
Michigan												
For. Ser.	103,126	5,988,802	38,443	65,182	1,072,462	11,038	37,200	236,213	4,607	205,540	6,597,477	[illegible]
Bur-St.	1,250,364	60,230,340	253,[illegible]	395,151	7,502,605	45,857	90,440	1,102,057	10,082	1,735,990	68,635,232	[illegible]
Total	1,353,492	66,219,142	292,[illegible]	460,333	8,575,067	57,295	127,675	1,338,300	14,[illegible]	1,941,530	75,232,709	365,[illegible]
Minnesota												
For. Ser.	59,450	7,250,892	38,483	25,875	1,525,574	13,280	14,434	477,741	7,117	109,790	9,331,207	[illegible]
Ind. Ser.	31,890	10,254,955	19,522	26,851	2,790,035	13,159	19,878	1,015,792	11,814	78,619	14,060,782	[illegible]
Bur-St.	325,354	44,684,902	111,182	75,073	4,196,507	21,540	8,950	471,309	3,191	409,047	49,352,[illegible]	[illegible]
Total	452,694	62,190,775	169,000	127,807	8,510,116	47,979	43,062	1,964,832	22,102	527,463	73,445,123	239,0[illegible]
Wisconsin												
For. Ser.	54,894	4,717,631	30,124	37,134	244,142	10,398	13,168	314,702	4,751	105,196	5,276,477	[illegible]
Ind. Ser.	101,107	20,931,815	70,615	47,803	3,721,374	26,361	20,400	939,321	9,743	169,310	25,592,510	[illegible]
Bur-St.	1,357,995	62,764,450	272,525	373,430	5,255,566	45,792	31,832	620,631	5,900	1,562,257	68,640,647	[illegible]
Total	1,513,996	88,413,896	373,264	458,367	9,221,082	82,551	65,400	1,874,655	20,374	1,936,763	100,109,634	[illegible]
Region												
For. Ser.	237,502	17,257,325	97,050	155,194	3,440,178	34,716	64,832	1,088,658	16,655	420,528	21,766,161	[illegible]
Ind. Ser.	133,497	31,200,232	90,110	75,110	6,523,352	39,643	40,428	2,757,538	21,583	249,035	40,481,122	151,[illegible]
Bur-St.	2,997,038	175,731,874	704,952	932,981	18,935,281	135,137	175,472	3,139,320	27,246	4,311,501	197,856,275	[illegible]
Region Total	3,368,037	224,289,[illegible]	892,119	1,142,295	28,898,811	209,496	280,732	6,985,516	65,484	4,981,064	260,115,530	1,167,[illegible]

Table 9. Summary of Nursery Sanitation Performed during 1954
North Central Region

Name and Ownership of Nursery	Operating Agency	Ranking	White Pine Trees in Nursery	Acres Protected	Acres Worked	Vines Destroyed	Man-Days Used
			Illinois				
State Tree Nursery	Bureau-State	Tenth	500,000	80	575	37	1
			Michigan				
Muskegon SCS Nursery (County)	Bureau-State	First	2,000,000	20	400	34	1
Newaygo SCS Nursery (County)	Bureau-State	Third	1,000,000	20	200	1,289	4
Total, Michigan - 2 Nurseries			3,000,000	40	600	1,323	5
			Wisconsin				
McKay, Rose (Private)	Bureau-State	Third	3,700	6	210	662	6
McKay #7 (Private)	Bureau-State	First	2,000	20	342	1,035	0
Nepon, 5-Mile (Private)	Bureau-State	Second	1,000,000	30	127	9,920	44
Total, Wisconsin - 3 Nurseries			1,005,700	56	679	11,617	50
Region Total - 6 Nurseries			4,505,700	176	1,854	12,967	65

Table II. Approximate Number of Persons employed by Months and Agencies,
North Central Region, Calendar Year 1951

Operating Agency	Number of Persons by Months												Average Per Month
	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total	
Illinois														
State & Private	1.0	1.0	1.0	1.0	3.0	1.5	1.0	1.0	-	1.0	1.0	1.0	13.5	1.1
Bureau	-	-	-	-	1.0	-	-	-	-	-	-	-	1.0	0.1
Total	1.0	1.0	1.0	1.0	4.0	1.5	1.0	1.0	-	1.0	1.0	1.0	14.5	1.2
Iowa														
State & Private	-	-	-	-	-	-	4.8	1.4	0.6	-	-	-	6.8	0.7
Bureau	-	-	-	1.0	1.7	3.8	3.0	3.0	1.0	1.0	1.0	1.0	16.5	1.4
Indian Service	-	-	-	-	0.8	1.7	-	-	-	-	-	-	2.5	0.2
Total	-	-	-	1.0	2.5	5.5	7.8	4.4	1.6	1.0	1.0	1.0	25.2	2.1
Ohio														
State & Private	-	-	-	0.1	0.3	0.3	0.8	1.6	0.1	-	-	-	3.2	0.3
Bureau	1.0	1.0	1.0	1.0	1.0	1.9	3.7	1.4	1.0	1.0	1.0	1.0	16.0	1.3
Total	1.0	1.0	1.0	1.1	1.3	2.2	4.5	3.0	1.1	1.0	1.0	1.0	19.2	1.6
Michigan														
State & Private	2.0	2.7	2.8	5.7	5.7	12.4	19.5	20.7	16.1	5.9	4.2	2.0	99.7	8.3
Bureau	4.0	4.0	3.0	3.0	3.4	7.1	5.2	5.0	4.5	4.0	3.7	3.0	50.5	4.2
Forest Service	-	-	-	-	0.3	18.8	19.4	18.8	5.4	-	-	-	66.7	5.6
Total	6.0	6.7	5.8	8.7	9.5	38.3	44.6	43.5	25.0	9.9	7.9	5.0	216.9	18.1
Minnesota														
State & Private	2.0	1.0	1.0	1.0	1.0	7.0	4.6	5.6	1.0	1.0	1.0	1.0	27.2	2.3
Bureau	5.0	5.0	4.0	4.5	3.9	4.2	5.1	8.0	3.0	5.2	4.0	3.0	48.0	4.0
Forest Service	1.0	2.0	2.0	4.1	5.6	105.8	83.0	68.2	16.0	6.2	3.0	2.0	293.9	24.0
Indian Service	1.0	1.0	1.0	1.0	1.0	13.0	-	-	-	-	-	-	18.0	1.5
Total	9.0	9.0	8.0	10.7	11.5	130.0	92.7	71.8	20.0	10.4	8.0	6.0	387.1	32.3

(Cont'd.)

Table 11 (Cont'd.) Approximate Number of Persons Employed by Months And Agencies
North Central Region Calendar Year 1951.

Operating Agency	Number of Persons by Months												Average per Month
	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total	
Wisconsin														
State & Private	2.0	2.0	2.0	3.0	4.5	12.2	37.1	18.5	4.5	3.0	3.0	2.0	93.8	7.8
Bureau	5.0	5.0	5.0	5.0	10.8	15.5	8.8	4.6	4.0	4.0	4.0	4.0	73.7	6.1
Forest Service	-	-	-	-	2.8	18.9	18.5	11.9	1.3	-	-	-	53.4	5.2
Indian Service	1.0	1.0	1.0	1.0	23.6	44.0	33.6	37.2	16.2	1.0	1.0	1.0	160.6	13.1
Total	8.0	8.0	8.0	9.0	41.7	93.6	97.0	72.2	26.0	8.0	8.0	7.0	381.5	32.5
Project Office														
Bureau	7.0	7.0	7.0	7.0	7.0	7.0	5.0	5.0	5.0	5.0	5.0	5.0	69.0	5.0
Entire Region														
State & Private	7.0	8.7	8.8	10.8	14.5	35.4	57.2	46.8	22.3	10.9	9.2	6.0	245.6	20.1
Bureau	22.0	22.0	20.0	21.6	28.9	37.5	29.3	20.0	16.5	16.2	16.7	15.0	265.7	22.1
Forest Service	1.0	2.0	2.0	4.1	8.7	153.5	120.9	97.9	22.7	6.2	3.0	2.0	424.0	35.3
Indian Service	2.0	2.0	2.0	2.0	25.4	58.7	36.6	37.2	16.2	1.0	1.0	1.0	181.1	15.1
Total	32.0	32.7	30.8	38.5	77.5	285.1	250.0	202.9	77.7	34.3	29.9	24.0	1,114.4	92.9

Table 12 Outbreak and eradicative summary of Dutch Elm Disease Tree Inspection to December 31 1951
North Central Region

State	Years Worked	Number of Areas Treated	Number of Trees Examined	Number of Trees Treated	Number of Trees Removed	Number of Cankers Removed	Number of Man-Days Used
Indiana	1947 - 1949	1	973	0	0	12	1
Iowa	1945 - 1950	54	45,997	725	734	1,951	67
	1951	4	1,600	32	14	33	2
	1945 - 1951	58	47,597	756	748	1,984	69
Ohio	1941 - 1947	5	1,306	44	13	186	15
Michigan	1935 - 1949	340	799 589	41,691	897	102,196	3 791
	1951	11	35 641	2,069	938	4,812	304
	1935 - 1951	351	835,230	43,760	835	106,988	4,095
Minnesota	1935 - 1950	184	453,514	45,042	3,434	79,940	5,068
	1951	2	20,000	500	0	500	6
	1938 - 1951	186	473,514	45,542	3,434	80,440	5,074
Wisconsin	1948 - 1950	7	965,558	19,926	4,991	26,388	852
Region	1933 - 1950	602	1,546,658	108,083	11,689	210,608	5,758
	1951	17	45,241	2,601	952	5,401	304
Total	1938 - 1951	619	1,892,094	110,684	11,988	216,004	6,956

Table 1[illegible]. North Central Regional Expenditures, by States and Appropriations, Calendar Year 195[illegible]

Appropriations	Illinois	Indiana	Iowa	Ohio	Michigan	Minnesota	Wisconsin	Project Office	Total Region
State Indirect Aid									
January to June	$ 210.00	$ 340.00	$ 450.00	$ 432.00	$ 675.00	$ 1,400.00	$ 3,320.00	$ -	$ 7,[illegible]
State Indirect Aid									
July to December	210.00	300.00	450.00	432.00	675.00	1,400.00	3,780.00	-	7,[illegible]
State Direct Aid									
January to June	2,846.41	375.00	115.61	513.64	9,724.47	3,673.00	3,972.12	-	2[illegible]
State Direct Aid									
July to December	2,382.94	130.00	777.65	820.64	17,551.27	4,211.67	19,597.51	-	45,[illegible]
Sub-Total, State	5,649.35	1,1[illegible]	1,79[illegible]	2,19[illegible]	2[illegible],6[illegible].74	10,684.67	3[illegible],16[illegible].63	-	[illegible]
Bureau [illegible]									
January to June	-	-	-	611.43	10,248.11	11,194.67	13,910.52	20,458.85	56,[illegible]
Forest [illegible]									
July to December	-	-	-	-	8,175.03	7,509.73	9,259.40	9,951.02	3[illegible]
Bureau [illegible]									
January to June	175.50	178.84	1,573.74	1,697.43	3,141.56	2,802.26	4,[illegible]	-	1[illegible]
Bureau-[illegible]									
July to December	-	2.65	2,757.39	[illegible],883.24	3,685.95	2,012.57	3,629.38	-	1[illegible]
Forest Service									
January to June	-	-	-	-	5,478.71	19,314.80	7,126.94	-	29,[illegible]
Forest Service									
July to December	-	-	-	-	12,306.48	36,565.54	6,691.55	-	5[illegible]
Indian Service									
January to June	-	-	372.30	-	-	1,614.80	19,607.17	-	[illegible]
Indian Service									
July to December	-	-	-	-	-		11,816.42	-	11,816.[illegible]
Indian Tribal									
January to June	-	-	-	-	-	-	-	-	-
Indian Tribal									
July to December	-	-	-	-		-	6,470.00	-	6,[illegible]
Sub-Total, Federal	175.50	181.49	[illegible],005.45	5,1[illegible].10	41,05[illegible]	[illegible]	[illegible],297.68	30,429.87	[illegible]
Sub-Total, All Funds									
January - June	[illegible]	[illegible]	[illegible],811.65	3,[illegible]4.50	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Sub-Total, All Funds									
July - December	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Grand Total	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Table 15 A. North Central Region Expenditures, Exclusive of Project Office
By State and Activity, Calendar Year 1951

Activity	Illinois	Indiana	Iowa	Ohio	Michigan	Minnesota	Wisconsin	Region	Percent each Activity
Leadership and Coordination	$ 910.00	$ 600.00	$ 600.00	$2,395.10	$8,416.44	$13,679.04	$19,426.00	$47,594.58	15.[illegible]
Local Control	961.31	-	5,618.49(a)	2,951.64	68,910.59	48,346.50	59,354.92(b)	185,973.58	51.[illegible]
Nursery Sanitation	34.18	880.00	300.00	100.00	98.00	400.00	737.35	[illegible]	0.[illegible]
Black Currant Elimination	-		-	-	2,267.59	-	-	2,267.50	0.[illegible]
Canker Pruning	-	-	33.30	-	3,768.91	252.68	-	4,054.89	1.[illegible]
Survey	683.06	-	-	1,380.00	10,948.75	23,613.07	8,921.08	[illegible]	[illegible]
Other Field Data	3,067.30	527.49	845.00	1,033.64	2,068.57	10,499.11	5,200.00	26,515.[illegible]	7.6
All Activities	$5,655.85	$1,427.42	$6,796.69	$7,860.38	$[illegible]	$95,301.[illegible]	$113,967.[illegible]	$[illegible]	100.00
Percent each State	1.9	0.4	2.3	2.5	[illegible]	20.3	39.5	100.00	

(a) Includes $0.40 as value of cultivated ribes destroyed

(b) Includes $0.15 as value of cultivated ribes destroyed

Table 13 B. North Central Region Expenditures, Exclusive of Project Office
by Appropriation and Activity, Calendar Year 1961

Source of Funds	Expenditure Class	Leadership and Coordination	Local Control	Nursery Sanitation	Black Currant Eradication	Canker Pruning	Surveys	Other Field Duty	All Activities	Per- Cent
State Extr. Aid	Salaries	57,634.00	-	4991.00	-	-	-	53,600.00	[illegible]	
	Non-Salaries	-	-	100.00	-	-	-	2,900.00	3,000.00	
	Total	7,634.00	-	1,080.00	-	-	-	5,300.00	14,874.00	4.5
State Direct	Salaries	7,466.49	39,080.10	577.73	2,700.00	5,314.15	2,243.26	2,907.67	58,797.00	
Aid	Non-Salaries	5,136.39	4,537.58	43.81	-	11.82	1,111.49	954.88	14,985.86	
	Total	12,602.88	43,625.76	721.54	2,700.00	5,325.05	3,354.75	3,861.95	73,392.86	22.3
Bureau	Salaries	21,530.17	18,565.38	46.00	147.52	496.18	9,358.65	6,359.38	55,643.88	
M-A	Non-Salaries	3,069.42	2,086.01	-	-	50.30	1,152.46	388.05	6,746.78	
	Total	25,599.59	20,651.69	46.00	147.52	546.04	2,429.11	6,772.02	61,190.66	18.7
Bureau	Salaries	480.33	15,393.45	-	-	582.36	2,143.26	2,412.30	20,996.00	
M-A	Non-Salaries	557.95	5,565.47	-	-	691.39	1,661.49	1,163.01	9,639.31	
	Total	998.11	18,958.90	-	-	1,253.32	3,805.44	3,601.31	30,615.31	9.3
Forest	Salaries	-	60,226.72	-	-	-	18,472.30	5,467.82	84,166.84	
Service	Non-Salaries	-	2,336.78	-	-	-	1,080.10	6.30	3,423.18	
	Total	-	62,153.50	-	-	-	19,559.60	5,474.12	87,187.02	26.6
Indian	Salaries	-	35,780.75	-	-	-	1,992.00	-	37,153.75	
Service	Non-Salaries	-	2,383.94	-	-	-	205.00	-	2,588.94	
	Total	-	38,164.69	-	-	-	1,197.00	-	39,742.69	12.1
All Funds	Salaries	37,151.01	167,063.69	1,905.73	2,847.52	5,380.68	38,595.37	18,777.77	302,831.80	
	Non-Salaries	10,743.97	16,909.88	143.81	-	734.31	3,210.53	4,737.65	52,479.76	
	Grand Total	47,894.89	183,973.56	1,949.54	2,847.52	6,054.92	37,805.90	23,515.42	101,341.68	100.00
Percent each Activity		15.9	61.1	0.6	0.9	1.8	12.6	7.8	100.0	

Table 13 C - Federal W-a Expenditures, Project Office, Calendar Year 1961

Period 1961	Salaries			Non-Salaries	Total
	Regular	L. A.	Total		
Jan.-June	18,249.46	-	18,249.46	2,182.99	20,432.45
July-Dec.	9,082.00	189.39	9,271.39	779.65	10,051.04
Total	27,331.46	189.39	27,520.85	2,962.64	30,483.49